American Foundryman

A PUBLICATION PRESENTING ASSOCIATION AND CHAPTER ACTIVITIES

Molders and Pourers at Work in an Aluminum Foundry. (Photo courtesy City Pattern Works, Detroit, Mich.)

February 1942

Protection of Foundries and Properties in War Time

WAR is with us and, therefore, another important obligation is imposed on the foundry industry, namely, to protect its operations and properties against all dangers from within and without.

The government has asked our industry to draft a set of rules and recommendations to be used as a guide in providing safeguards so that the maximum operating capacity of the foundries will not be in danger, because castings of all kinds are so absolutely essential in the production of ordnance and other war supplies.

The committee is now busy drafting a set of rules. Use will be made of any agency that can contribute any helpful facts in order that the recommendations may be as practical as possible.

In the meantime, study your individual problems in order to guard against sabotage and fifth column activities from within. Do not fail to consult with your local branch of the Federal Bureau of Investigation.

Try to answer for yourself the many angles to the following questions:

1. What will you do to effectively black-out your plant?
2. How will you organize your forces and protect your essential facilities in the event of aerial bombings?

Give these problems some earnest thought now, so that you will be better prepared when the rules are available in the near future.

Jas. R. Allan

JAS. R. ALLAN, Chairman,
Industrial Hygiene Codes Committee.

James R. Allan, assistant manager, industrial engineering and construction department, International Harvester Co., Chicago, has been connected in various capacities with this concern for 30 years. He has rendered outstanding service to the Association over many years as a committee leader along engineering lines, developing standards for refractories and codes of recommended practices applying to dust suppression equipment. He represents the Association on the A.S.T.M. Committee on Refractories and the American Standards Association Committee on Safety Code for Exhaust Systems. In 1939 Mr. Allan was awarded the J. H. Whiting Gold Medal for his outstanding contributions to the Association and the industry in the developing of the A.F.A. Industrial Hygiene Codes.

American Foundryman

CONTENTS

February, 1942

Volume 4 **Number 2**

Published by the American Foundrymen's Association, Inc., 222 West Adams St., Chicago, Ill., for the purpose of presenting Association and Chapter activities. Published monthly. Subscription price $1.00 per year. Single copies, 10c.

Entered as second class matter July 22, 1938, at the post office at Chicago, Illinois, under the Act of March 3, 1879.

Describes Causes and Remedies for Problems on Inclusions in Gray Iron Casting Work

By W. B. McFerrin,* Detroit, Mich.

The fourth defect on the list of gray iron casting defects as published in the November issue of the American Foundryman is Inclusions. Due to the space limited to this article only the definition and causes of Inclusions so far as accepted by the committee, plus three photographs of defects due to Inclusions, will be included. This is the third of a series of articles prepared by members of the Gray Iron Division Committee on Analysis of Casting Defects. Other defects discussed include Blows and Ram Off or Ram Away which appeared in the December and January issues respectively.

NUMBER 4 in the list of defects published on page 16 of the November issue of *American Foundryman* is "Inclusions." This subject is wide in scope, but due to the lack of space the author has limited himself to explaining the definition,

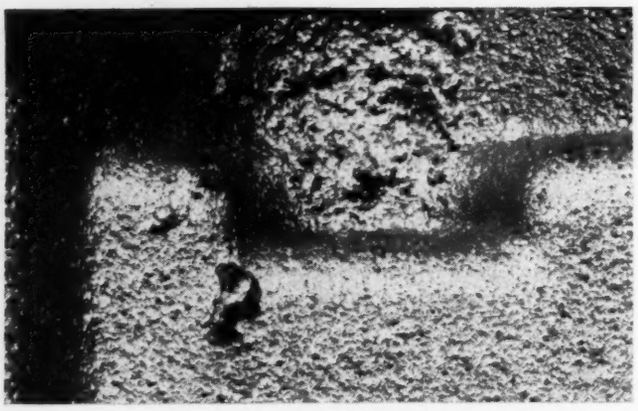


Fig. 1—Combination core sand inclusion and blow due to too green a core. (Also weak surfaced.) x 2

causes and remedies of this subject. It is hoped, by the committee, that constructive criticism will be made by anyone connected with the foundry industry, so that when this work is completed it will be satisfactory to, and usable by, the nation's foundrymen.

No. 4. Inclusions—Sand, Slag, Other Foreign Materials or Segregations of These

Definition:

Sand inclusions in castings are those cavities of irregular shape and size, the inner surface of which plainly shows the imprint of a granular material around which metal would flow. Slag inclusion, when caused by metal or ladle, have vitrified appearance, whereas slag inclusions from mold or core may appear in any stage from cindered to vitrified. Inclusions may be due to other foreign materials or segregations of metalloid combinations.

Causes:

A. *Due to Design*
   1. Promoted by unequal sections.

B. *Due to Pattern, Flask Equipment and Rigging*—None.

C. *Due to Sand*
   1. Low refractory mold material.
   2. Facing material which may produce a mold slag.
   3. Too high or too low moisture.
   4. Low green strength.
   5. Too low dry or hot strength.
   6. Low permeability—
      a. Too high fines.
      b. Too low grain fineness and poor grain distribution.

D. *Due to Cores*
   1. Improperly cleaned cores.
   2. Weak strainer cores.
   3. Weak surface cores.
   4. Improperly baked, either over or under (Fig. 1).
   5. Cores not properly coated.
   6. Low permeability.
   7. Improperly vented.
   8. Insufficiently reinforced.

E. *Due to Molding Practice, Gating and Risering*
   1. Sloppy and careless molding (Fig. 2).
   2. Soft, hard and uneven mold hardness.
   3. Dirty molds.

Fig. 2—Molding sand inclusion due to sloppy and careless molding. x 1/2

*Foundry Metallurgist, Cadillac Motor Car Division, General Motors Corporation.

4. Mold surface and parting material which may form mold slag.
5. Vegetable, plant and animal life.
6. Improper gating—
   a. Insufficient choking.
   b. Improper slag traps.
   c. Improperly prepared or designed pouring basins.
7. Shaved or rubbed parting lines or core print.

F. *Due to Iron Composition*

1. Wrong composition for section thickness promoting metalloid segregation.
2. Alloy or addition material dross or improperly dissolved alloys.

G. *Due to Cupola Operation*

1. Cold melted and dirty iron.
2. Oxidized or gassy iron caused by:
   a. Too low a bed.
   b. Wet and hard rammed bottoms.
   c. Improper slag blanket.
   d. Excess air causing loss of fluidity or gassy iron caused by improper balance in the cupola.

H. *Due to Pouring*

1. Boiling or green ladle causing iron to be cold or sluggish.
   a. Cold and damp ladles.

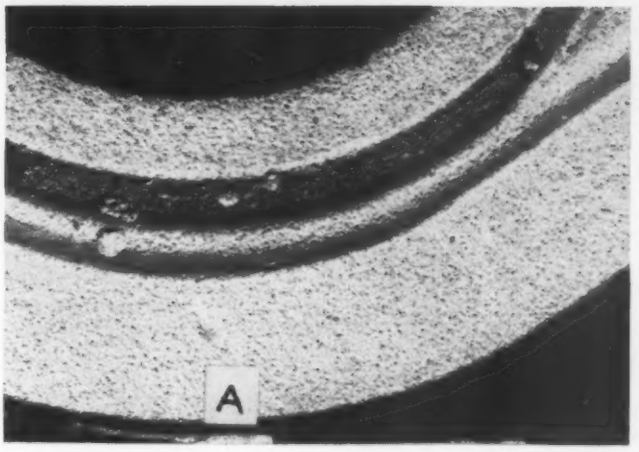


Fig. 3—Slag inclusion due to improper pouring. Casting gated at A. x 1

2. Improperly skimmed iron.
3. Too low pouring temperature, tending to hold inclusions.
4. Improper pouring (Fig. 3).
   a. Too slow.
   b. Intermittent or hesitating.

I. *Miscellaneous*

1. Alloy or additional material dross or improperly dissolved alloys.
2. Segregations of metalloid combinations.

Detroit Training Foundry Employees for War Effort

By Walter J. Larson,* Detroit, Mich.

SHORTLY after the program for vocational education for national defense was launched, a class was started for intensive training of semi-skilled foundry workers in the Cass Technical High School, Detroit, Michigan.

The first class started was a so-called pre-employment refresher course intended to give an opportunity to men who had at one time worked in foundries a chance to get their hand "back in," to develop the feel of the tools, and to promote a feeling of confidence before they were placed on the job. The training was to be for a period of ten weeks—six hours a day, five days a week, or a total of 300 hours. At the end of this period of training it was felt that the trainee should be able to walk alone, with little supervision, when given simple routine jobs.

The work at Cass Technical High School has been broken down as follows:

Unit I

Bench molding
Sand cutting (by hand)
Flat backs—plain (loose patterns)
Flat backs with green sand cores
Dry sand core jobs—flat backs
  a. Vertical
  b. Horizontal
  c. Balanced and chaplet setting
  d. Slab or cover cores
Irregular partings
Split patterns
Loose pieces and parts cast in cores
Ram up cores
Green sand and plaster matches—gated patterns
Weight molds
Pour and shift weights
Shake out

*Supervisor, Vocational Education Program for National Defense, Board of Education.

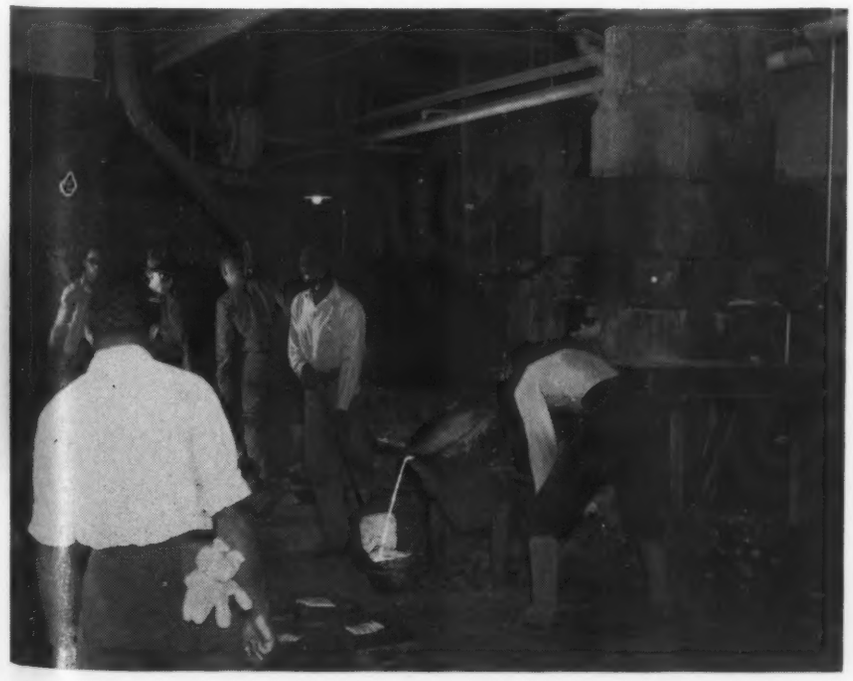


Fig. 1—Trainee pouring from receiving ladle into a waiting trainee's hand ladle.

Unit 2

Light side floor molding
Cut sand (by hand)
Flat backs—plain (loose patterns)
Flat backs with green sand cores
Flat backs dry sand cores
Irregular partings
Ram up core jobs—core secured to cope
Deep lifts—solder and gagger setting
Gagger and nail flat copes and drags (large area)
Split patterns
Cope and drag boards (patterns mounted and gates set)
Match plate jobs
Jumps or upsets
Ram runner boxes
Clamp and secure copes
Pour molds
Shake out and wet down heaps

Unit 3

Machine molding
Plain squeezer
Hand ram roll over machine (drag)
Hand ram roll over machine (cope)

Unit 4

Core making
Core sand mixing
Dump boxes
Frame boxes
Split boxes
Loose piece boxes
Dryers (irregular partings)
Wire—nails and rods (reinforcing)
Venting cores
File finish cores
Pasting cores
Blackening cores—brush—spray—dip
Tend core oven
Core machine (stock course)

Unit 5

Cleaning castings
Tumbling mill
Scratch brush
Chip (hand)
Snagging
Inspect for defects
Store castings or ship to school shops

Unit 6

Melting—Ferrous
Break pig and scrap weigh up charges
Chip and mud up cupola
Lay bottom
Make up coke splits (box measure)
Mud up ladles and dry
Tend receiving ladle (Fig. 1)
Melting—Non-Ferrous
Charge cupola
Tend furnace, adjust flame
Lift out crucible (tongs)
Pour (Fig. 2)

The shop instruction in the Cass technical foundry is directly in charge of Richard E. Mehrman, who has long been one of the top-notch gray iron molders in Detroit. John Campbell and Gene Poli, day school foundry instructors, Cass Technical High School, collaborated with Mr. Mehrman. All of the above mentioned men work under the direction of H. G. Schumacher, assistant director in charge of instruction for the Defense Training Program.

Related information or theory of foundry practice is held to a minimum, only essential information being given, and this is largely parceled out as individual instruction. The class meets as a group only when it is beneficial from a teaching standpoint to call them together. This gives the trainees an opportunity to stay in the shop and to get the maximum practical training in the unit for which they are being trained.

Gray iron heats are taken off three times a week. The castings produced are sent to the school shops where the machine tool trainees are being given practical instruction on various machines. The cupola used to melt the iron is 27-in. inside the lining and was built by the boys in the day school foundry classes. Brass, bronze, and aluminum are melted in a No. 40 crucible gas-fired furnace.

Each foundry trainee is required to inspect the castings he has made after they have been milled and he is required to diagnose and remedy any defect which is attributable to molding, core or sand conditions.

An accurate record is kept for each trainee and when he has finished his period of training he is given a certificate on which is indicated the number of hours he has trained in a unit. The Michigan State Employment Service also gets a duplicate record showing the grades the trainee made while in training. A record also is kept on file in the school and at the National Defense Office.

Since the inception of the Defense Training Program 157 trainees have had this foundry training. Our records show 50 of these men now working in Detroit foundries. We know through information given by other trainees that more than this number have "caught on," but they do not report back to the school that they are working and they are consequently not listed as employed. This is quite interesting as it shows the course is filling a definite need in the war efforts of the Detroit area.

It might be of added interest to the reader to know that the report from October 1, 1941, to October 31, 1941, inclusive, shows that there was a peak enrollment of 20,998 men in training in various classes sponsored by the National Defense Training Program in the Detroit area. The training is given in a number of necessary and approved subjects. The Detroit program is under the able direction of Dr. Warren E. Bow, Deputy Superintendent of Detroit Schools, and William E. Stirton, director of the program.

Fig. 2—Instructors supervising the pouring of molds.

Nominating Committee Presents the Officers and Directors Slate for 1942

D. P. Forbes, Gunite Foundries Corp., Rockford, Ill., Nominated as President, American Foundrymen's Association.

H. S. Simpson, National Engineering Co., Chicago, Ill., Nominated as a Member of the Board of Directors.

L. C. Wilson, Reading Steel Casting Div., American Chain & Cable Co., Inc., Reading, Pa., Nominated as Vice President, American Foundrymen's Association.

AT a meeting of the Nominating Committee of the American Foundrymen's Association held in the Palmer House, Chicago, Sunday, January 11, Duncan P. Forbes, president, Gunite Foundries Corp., Rockford, Ill., present vice president of the Association, was nominated to succeed H. S. Simpson, president, National Engineering Co., Chicago, as president. Mr. Simpson was nominated for a three-year directorship. L. C. Wilson, general manager, Reading Steel Casting Div., American Chain & Cable Co., Inc., Reading, Pa., was nominated for the vice presidency. Both the presidency and vice presidency are for one-year terms.

In addition to President Simpson, the following were nominated as directors for three-year terms:

J. E. Crown, Master Mechanic, U. S. Naval Gun Factory, Washington, D. C., and Vice Chairman, A.F.A. Chesapeake chapter.

I. R. Wagner, General Manager, Electric Steel Castings Co., Indianapolis, Ind., and first Chairman of Central Indiana chapter.

S. V. Wood, President and Manager, Minneapolis Electric Steel Castings Co., Minneapolis, Minn., member of Steel Division Advisory Committee and member of Board of Directors of A.F.A., Twin City chapter.

W. L. Woody, Manager, National Malleable & Steel Castings Co., Sharon, Pa., and first Chairman of Northeastern Ohio chapter.

The Nominating Committee met in accordance with Article IX, Section 3 of the by-laws, which states that said committee must meet at least 90 days prior to the annual business meeting at a time and place designated by the chairman and name candidates for the offices of president and vice president and for such directorships as shall become vacant at the close of the annual business meeting of the Board of Directors held in accordance with the provisions of the by-laws.

The Nominating Committee each year is elected at the annual business meeting of the Association and according to Article IX, Section 1 of the by-laws. The committee is composed of the last three living past presidents and four other members elected by the Association. The senior past president committee member is the chairman.

Members of this year's Nominating Committee were as follows:

Past President Marshall Post, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., *Chairman.*

Past President H. S. Washburn, Plainville Casting Co., Plainville, Conn.

Past President L. N. Shannon, Stockham Pipe Fittings Co., Birmingham, Ala.

L. E. Everett, Kaukauna Machine Corp., Kaukauna, Wis.

E. F. Hess, Ohio Injector Co., Wadsworth, Ohio.

W. D. McMillan, International Harvester Co., Chicago.

Stowell Wasson, National Malleable & Steel Castings Co., Indianapolis, Ind.

A short biographical sketch of each of the nominees follows.

D. P. Forbes

DUNCAN P. FORBES, president and general manager, Gunite Foundries Corp., Rockford, Ill., nominated for the presidency of the Association, is now serving as its vice president. Mr. Forbes served a three year term (1938-40) as a director of the Association and for one year as a member of the board's executive committee. At present, he is chairman of the Malleable Division of A.F.A., of which he has been a member since its organization in 1932, and chairman of the Malleable Division Advisory Committee. He also is a member of the Technical Activities Correlation Committee, Castings Promotion Committee, and Gray

Iron Subcommittee on Specific Applications. He also has served on several other A.F.A. committees, has presented papers and talks before A.F.A. national and chapter meetings, was active in the organization of the Northern Illinois-Southern Wisconsin chapter and has served on its board of directors.

Mr. Forbes is a native of Rockford and comes from a long line of foundrymen. His great-grandfather, Duncan Forbes, was one of the pioneers in the production of malleable iron in America and established the present company, of which Mr. Forbes is president, in 1854.

Mr. Forbes received his higher education at Yale University, New Haven, Conn., from which he graduated in 1919. The following year he took post-graduate work at Yale, specializing in metallurgy. Later, he spent some time in the laboratory of Professor Enrique Touceda, Albany, N. Y., studying the metallurgy of malleable iron.

In 1921, he entered the employ of the Rockford Malleable Iron Works, Rockford, as a molder for about a year, and then was appointed junior metallurgist. Later, he was appointed molding foreman and in 1925 was made work manager.

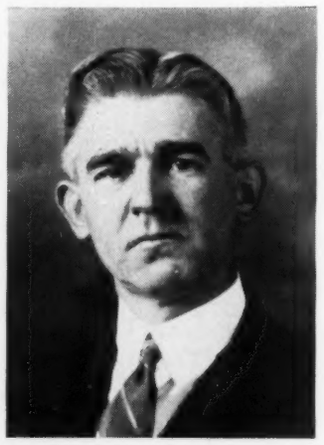
As a result of research work directed by Mr. Forbes, a process of producing high test gray iron was developed, using the air-furnace process of melting. The metal was given the trade name of "Gunite" and a separate company, The Gunite Corporation, was organized in 1928 to promote the manufacture and sale of the metal, with Mr. Forbes as president. Later, he was elected to the presidency of the Rockford-Northwestern Malleable Corporation, which became the Gunite Foundries Corporation in 1932.

L. C. Wilson

L. C. WILSON, general manager, Reading Steel Casting Division, American Chain & Cable Co., Inc., Reading, Pa., nominated for vice president of the Association, is well qualified for this office as he has served as director of the A.F.A. for three years (1926-28) and has for many years been a member of the Steel Division Advisory Committee, chairman of the Division's committee on impact testing, has served as chairman of convention sessions and in many ways has been active in Association work. From a more technical viewpoint, his interest in testing methods has caused him to be appointed as A.F.A. representative on A.S.T.M. Committee E-1, Methods of Testings, and also chairman of the A.F.A. Steel Division Committee on Impact Testing, which has been carrying out some interesting work on that subject.

Mr. Wilson secured his preparatory education in the schools of New Haven, Conn., and his technical training in the Sheffield Scientific School of Yale University, being graduated from this school in 1907 with a degree in mechanical engineering.

On completing his work at Yale, Mr. Wilson entered the sales department of the Harbison-Walker Refractories Co., representing this company over a period of years in its Pittsburgh, Chicago, New York and New England districts. Later he joined the staff of the Chain Belt Co., Milwaukee, as assistant to the vice president, later being made general sales manager. Transferring to the Federal Malleable Co., Milwaukee, as secretary, Mr. Wilson was later elected vice president and general manager, which position he relinquished when he accepted his present affiliation with the Reading Steel Casting Division.



J. E. Crown, U. S. Naval Gun Factory, Washington, D. C., Nominated as a Member of the Board of Directors.

J. E. Crown

JAMES E. CROWN, nominated as a director of the Association, is master mechanic, U. S. Naval Gun Factory, Washington, D. C. Mr. Crown served as vice chairman of the Chesapeake chapter for the past two years and was instrumental in helping to establish that chapter.

Mr. Crown has been active in the affairs of the Non-Ferrous Division of A.F.A., presenting several papers and acting as convention session chairman.

Born in Washington, D. C., Mr. Crown attended the public grade and high school there. He later attended special courses in mechanical engineering at George Washington University, Washington, D. C. In 1904 he started to work as an apprentice for the government. He was made molder, estimator and supervisor, but in 1916 he left the government's employe to teach at New York High School, New York City. He returned to government work the following year as a supervisor and in 1919 was made a master mechanic.

Mr. Crown has presented papers before many technical society meetings dealing primarily with bronze pressure castings and the founding of aluminum bronze.

H. S. Simpson

HERBERT S. SIMPSON, nominated for membership on the Board of Directors of the Association, now serving as president, has been connected with the foundry and foundry equipment industry for many years, both through his own efforts and the experience of his father, Peter L. Simpson, who, before his death in 1917, had spent his life in the foundry and machinery business.

Mr. Simpson was born in Minneapolis and moved to Chicago when a boy. After finishing his education, he engaged in the manufacture of clay working machinery, later becoming assistant to the president of the Hatfield-Penfield Steel Co., Bucyrus, Ohio. In 1917, he left that company to associate himself with the National Engineering Co., Chicago, manufacturers of sand mixing and conditioning

I. R. Wagner, Electric Steel Castings Co., Indianapolis, Ind., Nominated as a Member of the Board of Directors

and other foundry equipment of which organization he has been president since its corporation.

Mr. Simpson is a past director of the American Foundrymen's Association and a past president of the Foundry Equipment Manufacturers' Association. For many years he has supported the various research activities of the Association and has been very active in the Association in many ways. He has recently made many new friends and acquaintances throughout the country on his numerous chapter visits while serving as vice president and president of the Association.

I. R. Wagner

I. R. WAGNER, general manager, Electric Steel Castings Co., Indianapolis, Ind., has been nominated for a directorship of the Association. Mr. Wagner has served as chairman of the Central Indiana chapter for two years and is now serving as a member of that chapter's board of directors.

Mr. Wagner was born in Reading, Pa., in 1894 and was graduated from high school in Shamokin, Pa., in 1912. He then entered the employ of the Alan Wood Iron and Steel Co., Ivy Rock, Pa., as a helper in the maintenance department, and after a short period was transferred to the chemical laboratory as a test boy. After serving in various capacities in the then developing metallurgical department, he shifted in 1915 to the Midvale Steel Co., Philadelphia, as an analytical chemist and later became chief chemist, Midvale Works, Wilmington, Del. In 1918, he became identified with the inspection division of the ordnance department, establishing checking laboratories at various steel plants, and in 1919 again moved to the arsenal at Watertown, Mass., as a metallurgical chemist. In 1920, he became metallurgist and chief inspector, Electric Steel Castings Co., Indianapolis, and two years later was made vice president and general manager of the firm.

Besides his work with the A.F.A., Mr. Wagner is an active member of the Steel Founders' Society of America.

S. V. Wood

SHELDON V. WOOD, nominated as a member of the Board of Directors of the Association, is manager and president, Minneapolis Steel Castings Co., Minneapolis, Minn. At present, he is serving as a member of the Steel Division's Advisory Committee. Mr. Wood was active in the work of the Twin City

S. V. Wood, Minneapolis Steel Castings Co., Minneapolis, Minn., Nominated as a Member of the Board of Directors.

Foundrymen's Association and was one of the persons responsible for its addition to the A.F.A. chapter list. He also is a member of that chapter's board of directors.

Jefferson, Iowa, was Mr. Wood's birthplace and he attended the public grade and high school of that city. He attended the University of Minnesota, Minneapolis, and in 1904 was graduated with an engineering degree.

Following graduation, he worked for two years as an engineer for the Great Northern Railroad, St. Paul, Minn. Later, he went to the Seager Engine Co., Lansing, Mich., as an engineer and worked there till 1911, when he became a consultant engineer in Minneapolis, Minn. In 1913, he left that position and became affiliated with his present company.

Mr. Wood's interest in association and society activity is shown by his memberships in the American Foundrymen's Association, American Institute of Mechanical Engineers, American Society of Metals, Steel Founders' Society of America and the Minneapolis Engineers Society.

Mr. Wood also has been active in the affairs of the University of Minnesota and is now serving as a member of the Board of Regents of that institution.

W. L. Woody

WALTON L. WOODY, nominated as a director of the Association, is manager, National Malleable & Steel Castings Co., Sharon, Pa. Mr. Woody has been active in the malleable division of the Association and has served on numerous committees of that division. He also was the first chairman of the Northeastern Ohio chapter.

Mr. Woody was born in Terre Haute, Ind., and received his elementary schooling and college training there. He was graduated from Rose Polytechnic Institute with a degree in chemical engineering.

In 1914, he became affiliated with the National Malleable & Steel Castings Co., Indianapolis, working in the laboratory. He was then transferred to Toledo before he was sent on to Cleveland. At Cleveland, he was made chemist, metallurgist and then assistant superintendent. He then was transferred again to Chicago and made manager of that plant and after one year was returned to the Cleveland plant, where he served as manager for 11 years. Four years ago he was made manager of the Sharon plant of his company, the position he now holds.

Important Announcement

FOUNDRY AND ALLIED INDUSTRIES SHOW

THE Executive Committee of the American Foundrymen's Association, at meeting on January 11, voted to reaffirm Board resolutions of July 15, 1941, authorizing exhibits to be held in conjunction with the 1942 Convention and to approve all plans that had been developed in accordance with said resolutions with one exception, namely, preview for exhibits on Saturday, April 18.

It was the unanimous opinion of the Committee that the Preview Day custom, inaugurated when industry generally was working on a five-day week, should be suspended and that the opening time for exhibits be Monday, April 20, concurrent with the 46th Annual Convention and First Western Hemisphere Foundry Congress.

In lieu of this change in opening date, it also was voted to keep exhibits open until 10:00 P.M., Monday, April 20, and, with the cooperation of the already-organized committee of ninety members of the Northeastern Ohio Chapter of A.F.A., to secure an all-out attendance of men of the industry in the Cleveland district on Monday night.

The Monday night opening will also provide those arriving in Cleveland on the opening day with several additional hours for inspection of exhibits. The Convention and Exhibit calendar now will be

MONDAY, APRIL 20, THROUGH FRIDAY, APRIL 24, 1942
CLEVELAND, OHIO

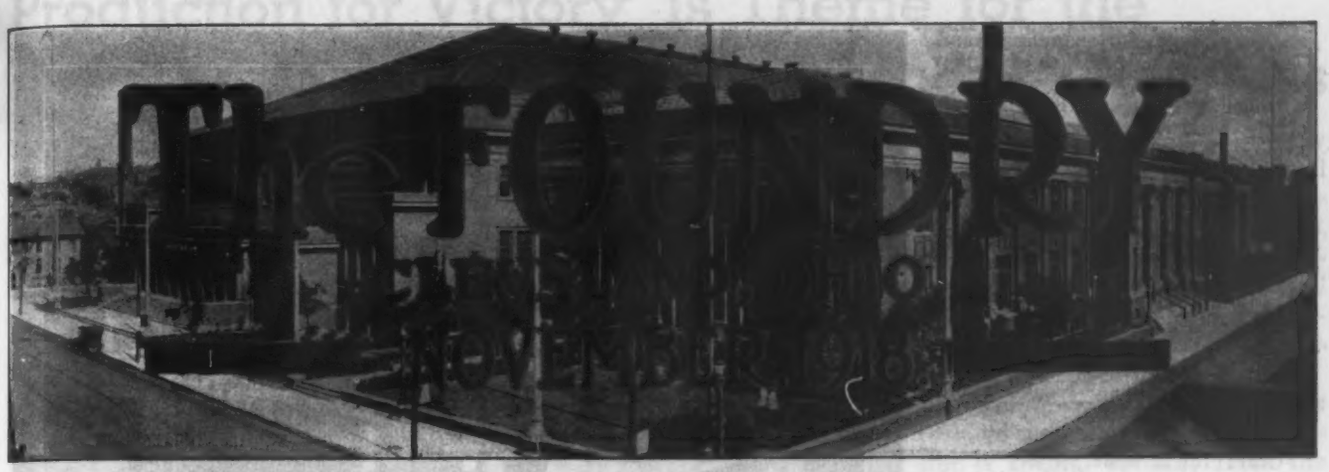
★

This is YOUR Convention and Congress. Make Plans NOW to attend.

Read reprint from November, 1918 issue of *The Foundry* on opposite page. Substitute the name of President Roosevelt for Wilson; Cleveland for Milwaukee; April 20 for October 7; 1942 for 1918, and you will have for all practical purposes the lead-off page for reporting the next

WIN-THE-WAR FOUNDRY CONVENTION AND SHOW

V
• • • —



Foundrymen Stage Big Win-the-War Convention

Patriotic Work of Tangible Value Accomplished at Big Allied Metals Congress in Milwaukee—Semisteel Shell Manufacture Discussed

FROM the stirring resolution telegraphed to President Wilson on Tuesday morning, through the annual banquet Thursday evening with its splendid patriotic addresses to the concluding session Friday morning, the great convention held in Milwaukee during the week of Oct. 7 under the auspices of the American Foundrymen's association, the American Institute of Mining Engineers and the American Malleable Castings association displayed a singleness of purpose and consistency of action fully in harmony with the grave necessities of the days through which the United States and its allies are now passing. In everyone's mind at Milwaukee was this one question—"How can we contribute more effectively to the winning of the war and to the abject and crushing defeat of German plans for world-wide tyranny?" Unofficially, but nevertheless aptly named the Allied Metals Congress, the Milwaukee foundry convention will go down in history as the unconditional surrender meeting of 1918. The win-the-war spirit was evident at every session, and reflected in every exhibit on the two floors of the great Milwaukee auditorium. This spirit found its most telling expression early in the week in the resolution already referred to. This resolution was adopted jointly through a unanimous rising vote by the American Foundrymen's association, the American Institute of Mining Engineers and the American Malleable Castings association. The complete text of the resolution is published on the following page. It pledges every resource of the allied metal trades to the government, not only for the production of materials for the conduct of the war, but for the accelerated manufacture of such materials in order to enable the government to bring about a speedy and crushing defeat of the enemy which will result finally in his abject and unconditional surrender. Tangible impetus was given this splendid resolution at every session throughout the week, and particularly at the great semisteel shell meeting on Thursday afternoon. This meeting was added to the regular program after the convention started at the request of the ordnance department in order to acquaint foundrymen with some of the details of the government's far-reaching plans for the

THE PRESENCE OF DISTINGUISHED FRENCH OFFICERS GAVE INTERNATIONAL COLOR TO THE CONVENTION

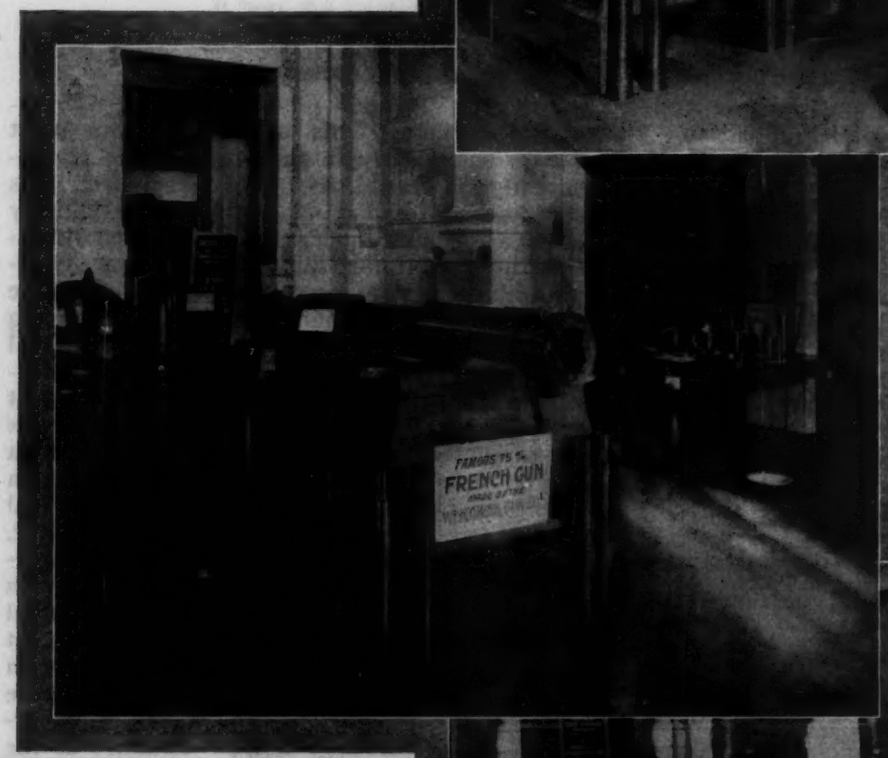
From left to right—Lieutenant Laurent of the French Technical Mission; Capt. O. C. Hall of the United States Army Ordnance Department; Capt. Guillemin of the French Technical Mission, in charge of the French Officers assigned to the Milwaukee convention.

also are used for handling sand. They can be lowered to the floor to permit easy loading. Through a hoisting gear, a 1-pound pull on the hand chain gives a 40-pound lift on the hoisting chains. One man can thus handle heavy loads easily.

The Pawling & Harnischfeger Co., Milwaukee, exhibited a ½-yard single line grab bucket, photographs being used to illustrate various types of cranes, hoists, grab buckets, drilling and boring machines and excavators. The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., exhibited photographs of its electric cranes and hoists for foundry use.

Cores for a wide variety of intricate work were displayed by a number of companies. In many cases these cores were for use in the production of ordnance equip-

THE ARMY ORDNANCE DISPLAY IN THE MAIN ENTRANCE CORRIDOR EMPHASIZED THE WAR CHARACTER OF THE ENTIRE EXHIBIT



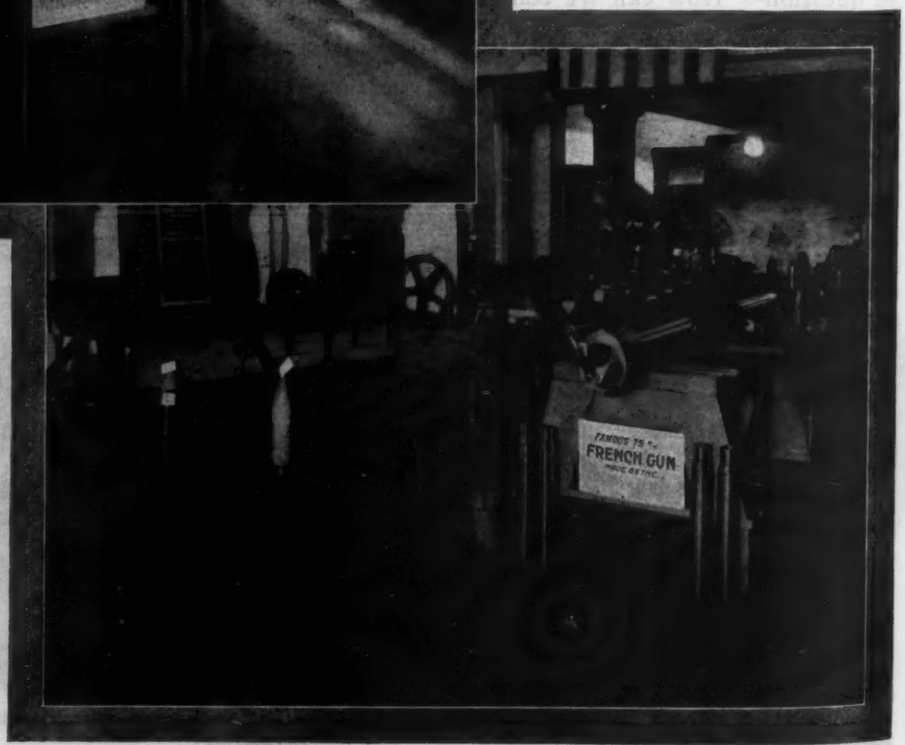
BRONZE CASTINGS WHICH FORM THE SLIDES FOR THE FAMOUS FRENCH SEVENTY-FIVES PROVED A CENTER OF ATTRACTION FOR VISITING FOUNDRYMEN

ment, army trucks and motors. These displays indicated clearly the national trend for more efficient methods of manufacture, and for conservation through increased durability of the machines employed in turning out finished products.

The American Gum Products Co., New York, had an interesting display showing cores made with the binder manufactured by this company. These cores included one for a 4-cylinder motor made with a 110 to 1 mixture, one for a large valve and one for the compression head for an ice machine.

The United Compound Co., Buffalo, displayed samples of its line of vent and pattern wax. Displays also were made of cores vented with this wax.

Practically all exhibitors of core compounds displayed cores or castings in the manufacture of which their products were employed. These exhibitors included Swan &



GUNS, SHELL, BOMBS, MORTARS, GRENADES AND MISCELLANEOUS ORDNANCE CASTINGS WERE SHOWN IN SUCH A MANNER THAT EVEN A CASUAL INSPECTION SERVED AS A LIBERAL EDUCATION IN THE MANUFACTURE OF WAR MATERIALS

Production for Victory Is Theme for the Western Hemisphere Foundry Congress

WITH the attack on Pearl Harbor and the subsequent declaration of war with the Axis countries, the urgent need for widespread dissemination of information on all phases of improved means for speeding up production of war material has stressed the importance of the First Western Hemisphere Foundry Congress and Foundry and Allied Industries Show.

In the four years of the first World War, the conventions and exhibitions of the American Foundrymen's Association became more helpful in each succeeding year, culminating in the 1918 Milwaukee Convention, held just a few weeks before the Armistice, at which there was a display of war materials with the active co-operation of the Ordnance Department which detailed officers to supervise. In a similar and even more extensive manner, the First Western Hemisphere Foundry Congress will do much to promote the foundry industry's part in the present conflict. Forseeing the trend of events, last July, the Board of Directors of the A.F.A. authorized that "The exhibit to be staged in conjunction with the annual convention of the Association in Cleveland, April 20 to 24, 1942, be planned with a view to furthering the National Defense Program."

Special Exhibit to Show Casting Possibilities in War Efforts

With the co-operation of executive officers of the Cleveland Ordnance District and the Cleveland Post of the Army Ordnance Association, a large section of the foundry show will be devoted to showing war equipment and materials and a display of the products of the foundry industry in the war efforts. The purpose will be to show foundrymen what parts they can produce to further the war program. Equipment and supplies being developed to increase production will be featured by the foundry equipment and supply manufacturers. Other government departments will have exhibits stressing other phases of war efforts.

Sessions of the Congress to Present Developments

As in the exhibits, the sessions of the First Western Hemisphere Foundry Congress will have the same purpose, that of stressing developments to aid in furthering war production of cast products. Many of these meetings will be of the informal, round table type, when latest problems will be brought up and authorities best able to present answers will be on hand.

Engineering and metallurgical developments, as well as general interest problems of cost methods, plant protection, foreman and apprentice training, will be presented at the many technical sessions. Cast iron shrinkage theories and practices and sand control will be the subjects covered at the shop operation course meetings, while core practices and theories will be stressed in the annual lecture course.

Each of the five divisions of the Association, namely, Steel, Malleable, Non-Ferrous, Gray Iron and Patternmaking, will hold its several sessions to discuss its particular problems, many of them bearing on developments due to war efforts and all having their place in improving casting production, processes and properties.

Arrangements are being made to have each day of the convention a special speaker from the Army, Navy or other government departments.

Northeastern Ohio Chapter Organizes Committees for Convention Work

The officers of the Northeastern Ohio chapter, which will be host to the First Western Hemisphere Foundry Congress and 46th annual convention of the Association, are showing that they are old hands at entertaining an A.F.A. convention. Learning from past experience of five conventions, Chapter Chairman Frank J. Dost, Sterling Foundry Co., Wellington, Ohio, with his board of directors, thought it was well to get started early and has appointed committees to care

Night scene of the Cleveland Museum of Art located in Wade Park.

for the welfare of their guests during convention week, April 20 to 24.

The local convention committee members, appointed by Chairman Dost, are listed below:

General Committee

General Chairman, Frank J. Dost, Sterling Foundry Co., Wellington, Ohio.

General Vice Chairman, John H. Tressler, Hickman, Williams & Co., Cleveland, Ohio.

General Secretary, Jack Lathrop, *The Foundry,* Cleveland, Ohio.

General Treasurer, Russell F. Lincoln, Osborn Mfg. Co., Cleveland, Ohio.

Ladies Committee

Chairman, Sterling Farmer, Sand Products Corp., Cleveland, Ohio.

Members to be appointed.

Banquet Committee

Chairman, Leon F. Miller, Osborn Mfg. Co., Cleveland, Ohio.

Vice Chairman, W. L. Seelbach, Forest City Foundries Co., Cleveland, Ohio.

J. H. Lansing, Malleable Founders' Society, Cleveland, Ohio.

H. A. Schwartz, National Mall. & Steel Castings Co., Cleveland, Ohio.

Transportation Committee

Chairman, H. F. Roberts, Williams & Co., Cleveland, Ohio.

Vice Chairman, B. F. Lambert, Diamond Alkali Co., Cleveland, Ohio.

Clay Hellwig, Kerchner, Marshall & Co., Cleveland, Ohio.

E. J. Metzger, Cleveland Quarries Co., Cleveland, Ohio.

Geo. Walton, Madison Foundry Co., Cleveland, Ohio.

Hotel Committee

Chairman, Tom Johnston, Republic Steel Corp., Cleveland, Ohio.

Vice Chairman, J. C. Maher, The Ohio Foundry Co., Cleveland, Ohio.

H. L. McKinnon, C. O. Bartlett & Snow Co., Cleveland, Ohio.

Wayne Stetson, Secretary, Cleveland Convention Bureau, Cleveland, Ohio.

M. G. Thomas, City Foundry Co., Cleveland, Ohio.

E. C. Zirzow, National Mall. & Steel Castings Co., Cleveland, Ohio.

Publicity Committee

Chairman, Ed. Bremer, *The Foundry,* Cleveland, Ohio.

Vice Chairman, R. C. Wellman, *The Foundry,* Cleveland, Ohio.

George Birdsall, *Steel,* Cleveland, Ohio.

B. W. Corrado, *The Iron Age,* Cleveland, Ohio.

Larry Jermy, *Machine Design,* Cleveland, Ohio.

Finance Committee

Chairman, Ray Fleig, Smith Facing & Supply Co., Cleveland, Ohio.

Vice Chairman, Homer Britton, Cleveland Co-Operative Stove Co., Cleveland, Ohio.

Frank Barton, Fulton Foundry & Machine Co., Cleveland, Ohio.

J. H. Bruce, Bowler Foundry Co., Cleveland, Ohio.

R. W. Hisey, Osborn Mfg. Co., Cleveland, Ohio.

F. W. Pascoe, Westinghouse Electric & Mfg. Co., Cleveland, Ohio.

Chas. Seelbach, Forest City Foundries Co., Cleveland, Ohio.

F. S. Wellman, Wellman Bronze & Aluminum Co., Cleveland, Ohio.

R. H. West, West Steel Casting Co., Cleveland, Ohio.

Welcoming Committee

Chairman, J. J. Witenhafer, Lake City Malleable Co., Cleveland, Ohio.

Vice Chairman, F. A. Stewart, National Mall. & Steel Castings Co., Cleveland, Ohio.

C. A. Barnett, Foundry Equipment Co., Cleveland, Ohio.

L. B. Brewster, W. W. Sly Mfg. Co., Cleveland, Ohio.

Jack Cleary, Sand Products Corp., Cleveland, Ohio.

W. C. Corbeau, National Mall. & Steel Castings Co., Cleveland, Ohio.

E. R. Crosby, Smith Facing & Supply Co., Cleveland, Ohio.

A. C. Denison, Fulton Foundry & Machine Co., Cleveland, Ohio.

Pat Dwyer, *The Foundry,* Cleveland, Ohio.

F. A. Ebeling, W. W. Sly Mfg. Co., Cleveland, Ohio.

B. D. Fuller, Whitehead Bros., Cleveland, Ohio.

C. C. Gibbs, National Mall. & Steel Castings Co., Cleveland, Ohio.

H. S. Hersey, C. O. Bartlett & Snow Co., Cleveland, Ohio.

G. J. Leroux, National Mall. & Steel Castings Co., Cleveland, Ohio.

W. C. Manwell, Fulton Foundry & Machine Co., Cleveland, Ohio.

A. B. Norton, Aluminum Co. of America, Cleveland, Ohio.

L. W. Olson, Ohio Brass Co., Mansfield, Ohio.

B. G. Parker, Youngstown Foundry & Machine Co., Youngstown, Ohio.

H. A. Reece, Meehanite Metal Corp., Cleveland, Ohio.

L. P. Robinson, Werner G. Smith Co., Cleveland, Ohio.

C. A. Schmidle, Republic Steel Corp., Cleveland, Ohio.

A. M. Siess, W. S. Tyler Co., Cleveland, Ohio.

F. G. Smith, Osborn Mfg. Co., Cleveland, Ohio.

W. G. Smith, Werner G. Smith Co., Cleveland, Ohio.

M. J. Sweeney, Allyne-Ryan Foundry Co., Cleveland, Ohio.

Milton Tilley, National Mall. & Steel Castings Co., Cleveland, Ohio.

Arthur Tumpach, Ferro Machine & Foundry Co., Cleveland, Ohio.

S. C. Vessy, W. W. Sly Mfg. Co., Cleveland, Ohio.

F. S. Wellman, Wellman Bronze & Aluminum Co., Cleveland, Ohio.

R. R. West, West Steel Casting Co., Cleveland, Ohio.

J. L. Wick, Jr., Falcon Bronze Co., Youngstown, Ohio.

M. W. Zeman, Osborn Mfg. Co., Cleveland, Ohio.

N.E.O. Day Committee

Chairman, W. E. Goebert, Bowler Foundry Co., Cleveland, Ohio.

Vice Chairman, E. M. Follman, Griffin Wheel Co., Cleveland, Ohio.

Milo Barrett, Chandler & Price Co., Cleveland, Ohio.

C. M. Beattie, Lake City Malleable Co., Cleveland, Ohio.

J. C. Beattie, Fulton Foundry & Machine Co., Cleveland, Ohio.

G. L. Bierly, Mansfield Brass Foundry Co., Mansfield, Ohio.

G. A. Boesger, W. W. Sly Mfg. Co., Cleveland, Ohio.

H. F. Bradway, Henry Furnace & Foundry Co., Medina, Ohio.

C. F. Brecknock, Lorain Castings Co., Lorain, Ohio.

C. W. Briggs, Steel Founders' Society, Cleveland, Ohio.

Homer Britton, Cleveland Co-Operative Stove Co., Cleveland, Ohio.

J. V. Brost, Brost Pattern Works, Cleveland, Ohio.

E. W. Brown, Union Metal Mfg. Co., Canton, Ohio.

F. C. Cech, Cleveland Trade School, Cleveland, Ohio.

Walter Chatfield, Fate-Root-Heath Co., Plymouth, Ohio.

H. J. Colby, Fanner Mfg. Co., Cleveland, Ohio.

G. M. Cover, Case School of Applied Science, Cleveland, Ohio.

Angelo Dublo, Sterling Foundry Co., Wellington, Ohio.

H. A. Dunphy, The Pitcairn Co., Barberton, Ohio.

J. E. Dvorak, Eberhard Mfg. Co., Cleveland, Ohio.

R. W. Eichenberger, Acme Foundry Co., Cleveland, Ohio.

W. J. Feth, Forest City Foundries Co., Cleveland, Ohio.

W. W. Firestone, Ashland Malleable Co., Ashland, Ohio.

F. J. Fredriksen, Westinghouse Electric & Mfg. Co., Cleveland, Ohio.

J. B. Freer, Machined Steel Casting Co., Alliance, Ohio.

D. J. Gluntz, Gluntz Brass Co., Cleveland, Ohio.

J. G. Goldie, Cleveland Trade School, Cleveland, Ohio.

H. C. Gollmar, Elyria Foundry, Elyria, Ohio.

Fred Grondie, City Foundry Co., Cleveland, Ohio.

D. Gurney, Warner-Swasey Co., Cleveland, Ohio.

Joseph Hanks, Taylor & Boggis Co., Cleveland, Ohio.

E. J. Hedlund, Urick Foundry Co., Erie, Pa.

E. F. Hess, Ohio Injector Co., Wadsworth, Ohio.

J. B. Heisler, A. C. Williams Co., Ravenna, Ohio.

R. S. Hoffman, Hoffman Foundry Supply Co., Cleveland, Ohio.

J. W. Horan, Sandusky Foundry & Machine Co., Sandusky, Ohio.

E. M. Horkan, East Technical High School, Cleveland, Ohio.

Louis Klein, Crucible Steel Casting Co., Cleveland, Ohio.

D. Lansdowne, West Steel Casting Co., Cleveland, Ohio.

J. H. Lansing, Malleable Founders' Society, Cleveland, Ohio.

W. O. Larson, W. O. Larson Foundry Co., Grafton, Ohio.

Wm. Love, Colonial Foundry Co., Louisville, Ohio.

W. C. Manwell, Fulton Foundry & Machine Co., Cleveland, Ohio.

Harvey Marette, National Metal Abrasive Co., Cleveland, Ohio.

D. J. McAvoy, Grabler Mfg. Co., Cleveland, Ohio.

E. A. McDonald, Berted Foundry Co., Columbiana, Ohio.

E. N. McKelvey, Otis Steel Co., Cleveland, Ohio.

H. L. McKinnon, C. O. Bartlett & Snow Co., Cleveland, Ohio.

H. L. McKinnon, McKinnon Iron Works, Ashtabula, Ohio.

George McNab, Hill-Acme Co., Cleveland, Ohio.

E. J. Metzger, Falcon Bronze Co., Youngstown, Ohio.

C. J. Miller, Fremont Foundry Co., Fremont, Ohio.

P. R. Mooren, Meech Ave. Foundry, Cleveland, Ohio.

E. Moyer, Ohio Cultivator Co., Bellevue, Ohio.

H. C. Nicholas, Quality Castings Co., Orrville, Ohio.

H. M. Oehling, National Mall. & Steel Castings Co., Cleveland, Ohio.

C. W. Ohly, Thompson Products, Inc., Cleveland, Ohio.

F. J. O'Patrny, Frederick B. Stevens Co., Cleveland, Ohio.

B. S. Parker, Youngstown Foundry & Machine Co., Youngstown, Ohio.

B. R. Pearse, Atlas Foundry Co., Cleveland, Ohio.

J. J. Potts, American Steel & Wire Co., Cleveland, Ohio.

J. V. Proshek, Cuyahoga Foundry Co., Cleveland, Ohio.

W. E. Rayel, Werner G. Smith Co., Cleveland, Ohio.

E. T. Remy, Schill Mfg. Co., Crestline, Ohio.

Marcel Reyman, Atlantic Foundry Co., Akron, Ohio.

S. P. Schloss, Superior Foundry Co., Cleveland, Ohio.

C. A. Schmidle, Republic Steel Corp., Cleveland, Ohio.

M. B. Schramm, Cuyahoga Heights School, Cleveland, Ohio.

C. C. Scott, Coe Mfg. Co., Painesville, Ohio.

C. H. Shurmer, Norwalk Foundry Co., Norwalk, Ohio.

A. M. Siess, W. S. Tyler Co., Cleveland, Ohio.

A. R. Silver, Quaker City Foundry Co., Salem, Ohio.

A. D. Smith, Bethlehem Steel Corp., Cleveland, Ohio.

E. W. Spade, Champion Hardware Co., Geneva, Ohio.

George Stellman, Johnston & Jennings Co., Cleveland, Ohio.

F. A. Stewart, National Mall. & Steel Castings Co., Cleveland, Ohio.

O. S. Stewart, Cleveland Metal Abrasive Co., Cleveland, Ohio.

M. J. Sweeney, Allyne-Ryan Foundry Co., Cleveland, Ohio.

W. A. Thomas, Kilby Mfg. Co., Cleveland, Ohio.

H. J. Trenkamp, Ohio Foundry Co., Cleveland, Ohio.

John Vickers, Gray Iron Founders' Society, Cleveland, Ohio.

J. E. Wagner, American Steel Foundries, Alliance, Ohio.

George Walton, Madison Foundry Co., Cleveland, Ohio.

W. M. Weil, National Smelting Co., Cleveland, Ohio.

Gordon Wilsea, Parker-Street Castings Co., Cleveland, Ohio.

F. Wisehan, Ferro Machine & Foundry Co., Cleveland, Ohio.

F. L. Wolf, Ohio Brass Co., Mansfield, Ohio.

W. L. Woody, National Mall. & Steel Castings Co., Sharon, Pa.

M. W. Zeman, Osborn Mfg. Co., Cleveland, Ohio.

Measuring the Fluidity of Cast Steel--II†

By H. F. Taylor* and E. A. Rominski,* Washington, D. C.

H. F. Taylor

A test mold employing a spiral flow channel is described which can be used satisfactorily for measuring the fluidity (castability) of steel in the furnace prior to tapping or in the ladle on the pouring floor. Advantages resulting from the use of this test for measuring the fluidity of the steel made in the 3-phase, electric-arc furnace at the Naval Research Laboratory are described. It is possible to follow changes in the castability of steel brought about by deoxidizers and alloying elements or by variations in temperature or in furnace practice. The technique for obtaining such information is described. This is the last section to this paper, the first appeared in the January issue of American Foundryman.

E. A. Rominski

FROM routine use of this test on all heats made in the laboratory arc furnace, definite advantages in better steel and cleaner ladles have resulted. Not only has it been possible to follow the progress of the heat to determine the proper tapping time, but it has been possible to determine the effects of changes in slag or charging practice, alloying elements, and type, amount, time, and order of adding deoxidizers. Rapid changes in fluidity as a result of suddenly increased or decreased power input can be readily detected.

*Associate Metallurgist and Assistant Metallurgist, respectively, Naval Research Laboratory, Anacostia Station.

† Published by permission of Navy Department.

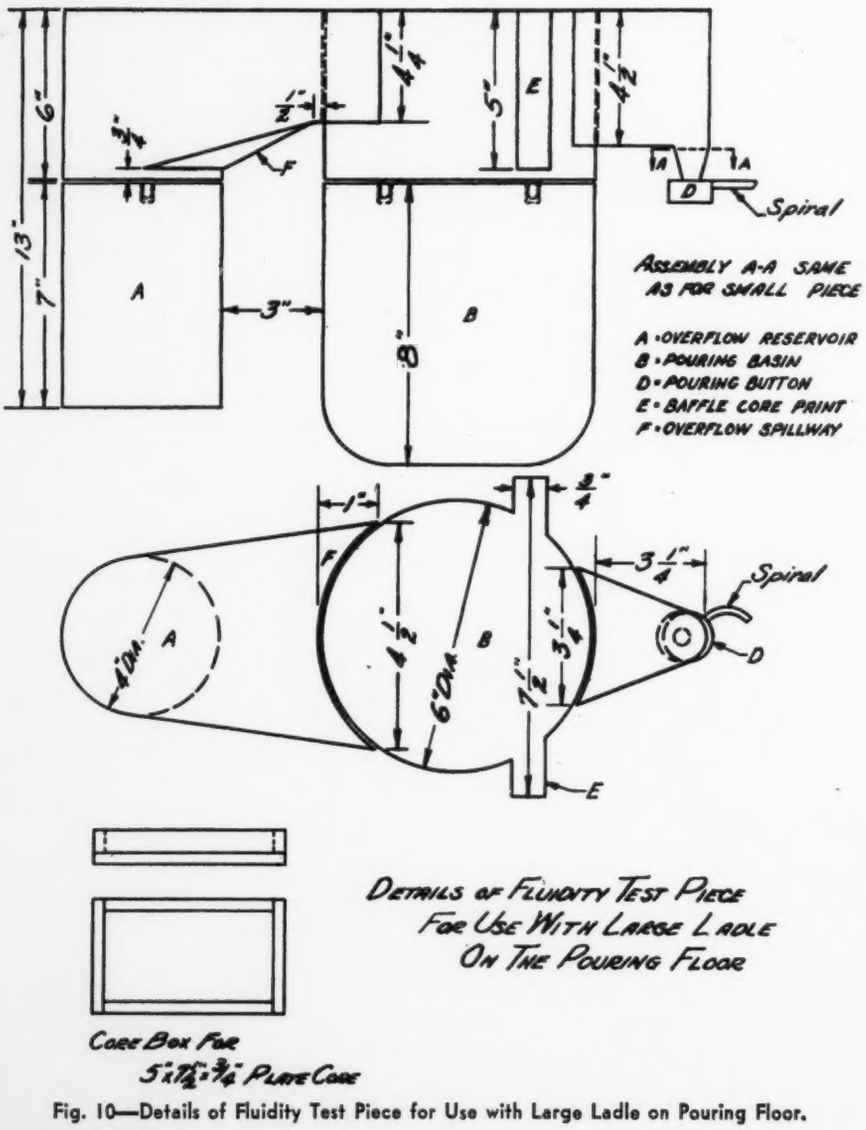


Fig. 10—Details of Fluidity Test Piece for Use with Large Ladle on Pouring Floor.

For example, one test was made on relatively cold steel giving a spiral length of 10-in. A subsequent test taken 10-min. later, while the power had been raised sharply, gave 17-in. Tests taken before and after final manganese additions gave 18-in. and 18¼-in., respectively, whereas tests 3 min. later, before and after final silicon additions, gave 18½ and 26-in., respectively. Fluidity was greatly improved by the addition of silicon but was not changed by the manganese.

One series of tests involved measurements at the furnace as well as on the pouring floor. Just before adding the final additions of manganese and silicon the length of spiral was 17 and 16½-in. on two tests. Following the addition, the flow increased to 20 and 20¼-in.

At this point, the bath was rabbled and tapped and optical pyrometer readings indicated the temperature as 2925°F. Using a ½-ton capacity teapot ladle, a mold was poured taking about 300-lb. of metal. Next two fluidity test pieces were poured and flow had fallen to 16¼ and 16½-in. as a result of heat loss to the ladle and atmosphere, the temperature indicated as 2730°F. Two more large castings were poured and then three spirals were poured in order at 1 minute intervals. Only a small amount of metal was left in the ladle and temperature was falling rapidly. The casting lengths were 15¼, 14, and 12-in. in the respective pouring order. The temperature was estimated by quick pyrometer readings to be about 2680°F. for the last mold.

It was found possible, by asso-

Fig. 11—Pattern for Large Fuidity Test Piece Spaced Properly for Ramming in Drag.

ciating the length of spiral obtained at the furnace before tapping with the manner in which the steel handled on the pouring floor and with the quality of castings obtained, to predict the casting behavior of any heat of steel. Spiral lengths of at least 20-in. are required before the addition of final deoxidizers in the practice of the Naval Research Laboratory. This usually results in a spiral length of 25 to 28-in. just prior to tapping. Thirty-two to 36-in. final fluidity is recommended for larger heats where more molds must be poured.

Results of Tests at Washington Navy Yard

Following the satisfactory application of the spiral mold for fluidity measurements at the ½-ton furnace at the Naval Research Laboratory, tests were made using the 3-ton furnace at the Washington Navy Yard. In this case, removal of the sample was thought to be complicated by the more intense heat from the larger door opening and the greater distance to the center of the bath. Planning for this, a larger and heavier spoon was welded to a 1½-in. diameter iron bar about 4½-ft. long. A pipe section 4-ft. long was welded on the bar to give an overall length slightly greater than 9-ft. without unnecessary weight. The heavy iron bar was necessary to prevent bending from the weight of sample when the rod heated up near the spoon. The technique for handling this sampling spoon is the same as for the smaller one used at the ½-ton furnace, except that as it is drawn from the furnace, two extra men are needed to support the sample and move it into position for pouring. This is done by means of a cross bar slipped under the rod at any convenient point be-

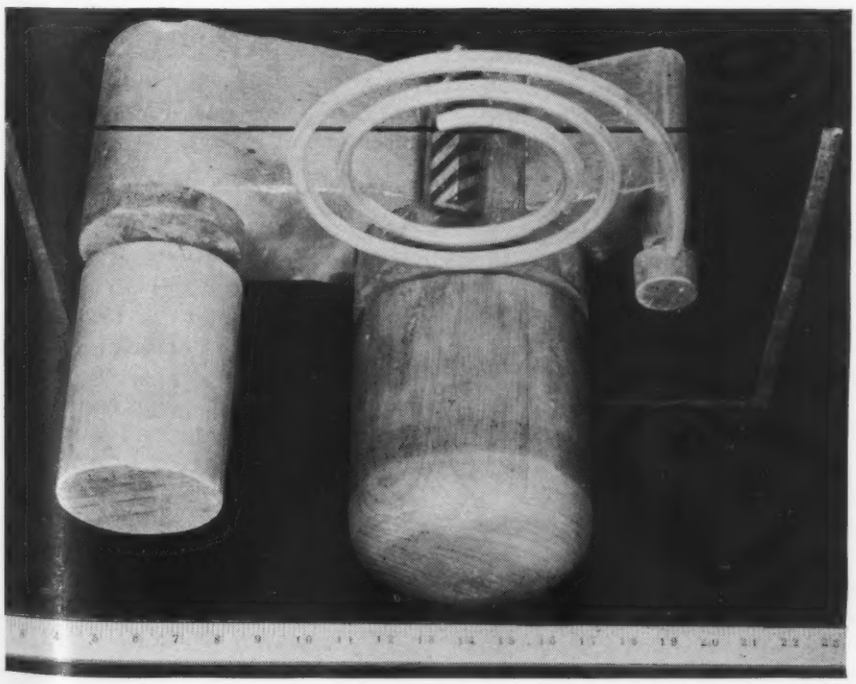


Fig. 12—Pattern for Large Fluidity Test Piece Assembled with Parts Separated by Glass Plate.

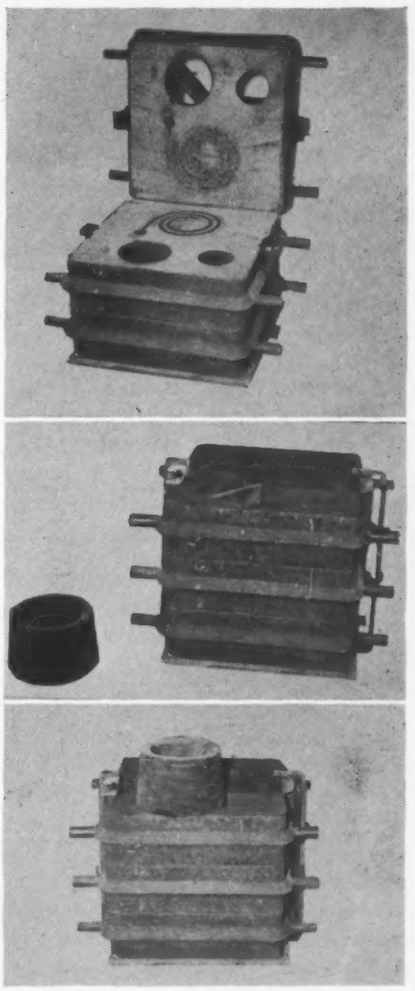


Fig. 13—Mold for Large Fluidity Test Piece. Top — Mold Unassembled. Center — Mold Showing Baffle Plate. Bottom—Mold Ready for Pouring.

tween the sample and the operator.

Several satisfactory tests were made in this way, but it was later found that sampling could be done with the smaller spoon which requires only a single operator. In larger furnaces, however, this might be impossible and the use of the larger spoon would be necessary. The total time for making the complete test is well under 2 min., so the use of four men (three to handle the spoon and one to stir in the aluminum) is not a disturbing factor.

Results obtained from this work at the Washington Navy Yard are few because the method has only been tried for a short time. Tests taken before and after final deoxidizing additions to the furnace give 26 and 36-in. of flow respectively on a plain carbon heat of approximately 0.20 per cent carbon. A nickel steel heat, from which a spiral was poured just before tapping, gave 49-in. flow. This steel was known to be more fluid than plain carbon steels because of the presence of 3½ per cent nickel.

Large Fluidity Test Piece for Use on Pouring Floor

The small mold previously described is satisfactory for ½-ton or smaller ladles but is unsatisfactory for larger bottom pouring ladles because of the rapid rate of flow of steel from the nozzle. At the request of the Norfolk Navy Yard for a method of measuring fluidity of cast steel under these conditions, the test piece shown in Figs. 10, 11, 12, and 13 was designed. This is merely a large scale modification of the smaller fluidity test mold. Principles of flow are identical and measurements made by the appropriate use of either test are comparable.

The molds can be made of green sand if desired, but dry sand is preferable when they are allowed to stand unused for more than a few hours. Ordinary molding methods are used and the effects of variables are the same as discussed for the small mold. The Norfolk Navy Yard made the mold of cores, thus obviating the necessity for a flask, and molds were made up and stored for use as needed.

When making a test, the ladle nozzle is centered above the pouring reservoir (*B*, Fig. 10) and the mold filled at an ordinary rate. The metal builds up to the level of the overflow into the pouring button and fills the spiral under conditions as free from turbulence as possible. The overflow trough (*F*) is ¼-in. higher than the first and limits the variation in ferrostatic head to about this amount. As soon as the metal starts to flow into the overflow reservoir (*A*), an observer calls "full" and pouring is stopped as quickly as possible. If metal should build up above the level of the overflow, the value of the controlled head would be lessened and it would be harder to shake the test casting from the mold than would be the case if pouring were stopped rapidly enough to prevent any metal being left on the slanting overflow.

Tests were made at the Washington Navy Yard, and it was found necessary to place a sand baffle plate (shown as *E* in Fig. 10) in front of the overflow into the spiral to prevent metal splashing or spurting prematurely into the flow channel and interfering with normal flow. This baffle also serves as a skim gate to keep slag or dross from getting into the test channel. A runner guide, shown in Fig. 13, is always used.

After providing the baffle core a series of tests were made at the Washington Navy Yard which proved the test piece to be satisfactory. Six dry sand molds were prepared and placed in position on the foundry floor. Small castings were being poured and several openings were necessary so that there was a large drop in the temperature of the steel between the beginning and end of pouring. A 10-ton ladle was used and, after first pouring a large mold to heat up the nozzle, two test castings were poured. These measured 26 and 25½-in.

After approximately half the metal in the ladle had been poured into nine molds, the second pair of tests was taken. Only one spiral filled in this test as sand had clogged the flow channel but the good spiral measured 19-in. After pouring nearly all the remaining metal into 16 molds, the final pair of tests measured 8 and 7-in. in the order poured. These tests, as well as one more series which gave equally good results, established the spiral mold as satisfactory for measuring the fluidity of cast steel on the foundry floor.

It is impossible to list all applications for this type of testing as they depend largely upon the individual foundry. For example, a small casting producer would only be concerned with the fluidity test at the furnace while the heavy casting manufacturer would also be interested in the condition of the metal at the time of pouring. By taking tests before and/or after pouring a large casting, it would be possible to tell the effect of fluidity on such factors as hot-tear, center-line weakness, etc. If aggravated conditions in the cooled casting could be associated with the fluidity of the steel used, many current founding problems would be explained and the foundryman possibly provided with a means for their solution. It might prove practical to mark clearly on the pattern the spiral lengths of the metal to be used for pouring a particular casting. This would facilitate the manufacture of castings ordered from this pattern at some later date when the foundry details had been forgotten.

From the large number of tests conducted with the smaller fluidity mold and from the comparatively few trials made with the large type, several advantages can be claimed for the spiral as an effective medium for measuring the fluidity of cast steel. The mold is simple, convenient to prepare, economical, direct reading, and compact. Results obtained from its use are highly reproducible. No careful leveling is necessary and the design of the flow channel is such that differences in flow lengths satisfactorily indicate small variations in the fluidity of the steel.

Provision is made for 55-in. of flow. While this length is seldom reached (never for plain

carbon steels at temperatures below 1700°C. (3092°F.), the difference in flow between extremely low temperatures and high temperatures or between very sluggish and very fluid steels is ample for testing under the most extreme conditions normally encountered. For a given steel analysis and shop practice, it would be possible to calibrate the spiral directly in temperature units with a probable accuracy of ± 250°C. Such calibration would have to be done using a thermocouple maintained in the steel bath and pouring spirals at small increments of temperature.

To date no refractory is available which can be used as a sheath for protecting thermocouples from the corrosive action of basic slags and temperature measurements in this way are extremely troublesome. Acid slags present no unusual difficulty, however, when quartz is used as a protecting sheath. Since temperature is not always a true criterion of the casting quality of steel, sole reliance on this quantity would many times be misleading. The more valuable calibration would be in terms of results obtained on the pouring floor—convenient handling, absence of skull in the ladle, and good castings.

A Simple but Effective Training for Molders

By F. W. Hunter,* New Haven, Conn.

The author of this paper has been employed by Sargent & Co. for 43 years. He was made foundry superintendent in 1919 and has held that position since that date. He has taken an active part in the Association's apprentice training work for many years. At the present time he is a member of the Apprentice Training Committee, Subcommittee on Program and Papers and Subcommittee on Publication on Jobs in the Foundry.

THE practice of making molders has been in operation at the foundry of Sargent & Co., hardware manufacturers, for more than forty years.

We have never adopted a system whereby the young man coming into the foundry enters into an agreement covering a certain length of time, but simply hire them with the understanding that they are to become our future molders.

The young man is started in either the cleaning or inspection gang where he learns the difference between a good and a bad casting, and why the bad casting must be thrown away. During the heat, or pouring time, he comes in the foundry and helps the molder by shifting the mold weights and dumping the molds. Our work is all snap flask work. In that way he gets acquainted with the molten metal so that when he begins to handle and pour the metal he is not as nervous as he would be if he started molding without first going through his training period.

On account of the thin and light nature of our work the metal is all carried in small hand ladles. The men go to the furnace for their metal, thereby getting the metal from the furnace to the molds in the shortest period of time and with a minimum loss of heat units. As previously stated, our work is all snap flask work, and it is a 100 per cent piece work foundry. We have a man whose duty it is to instruct the apprentices and he spends his whole time doing just that. On account of our large variety of patterns, and having an instructor to teach them, we are able to start the apprentice on a piece work basis, giving him simple work at first and increasing the quality of work given him as he improves.

Our experience has been that anyone who is intelligent enough to become a good molder, and is interested, will after about three weeks in the foundry earn more than he did in the handling gang. At least 90 per cent of the time a molder of our own training, after three months of experience, is actually worth more to us than most of the journeymen molders that could have been hired. By that time he is able to produce as much as many of the older men, although, of course, it takes a much longer period before he reaches a point where he would be expected to make any pattern sent to him.

The time we allow for a man to become an efficient workman is two years. During that period we intend to give him as large a variety of work as possible, and not to keep him on any one stated line of patterns. Then he may be able to take most any pattern sent him and produce good work.

Our products are all made from either gated or plate patterns. Our apprentices are started on gated patterns from which they learn to make their own matches, and in so doing learn the draft lines of a pattern. After they have worked on gated patterns long enough to learn how to handle metal and pour successfully, those who are most adaptable for machine molding are then transferred to plate patterns and machines. There they produce more and handle more metal.

Although we have no specific apprentice training program, we have been making our molders for more than forty years. Today 95 per cent of the molders employed made their first molds under our supervision.

Although our method may seem crude to some, it has, over a long period of time, worked out very successfully. I also believe it has created an employee loyalty that could have been attained in no other way.

*Foundry Superintendent, Sargent & Co.

Congratulations!

OUR congratulations to N. Harold Boardman, who has been appointed manager and treasurer of Elmira Foundry Co., Inc., Elmira, N. Y., an affiliate company of the General Electric Co., Schenectady, N. Y. Mr. Boardman is very active in the work of the Association, being particularly interested in the work of the Gray Iron Division and the Central New York Chapter, of which he is now vice chairman and has served as a member of the Board of Directors.

Western Michigan Pressed by Toledo in Chapter Contest

WESTERN MICHIGAN retained the lead gained last month in the national membership drive but is being pressed closely by the new Toledo chapter and its lead has been cut from 169 points to 89 points. Toledo jumped from 4th place to 2nd place during the past month, pushing Northern Illinois-Southern Wisconsin and the Wisconsin chapters, which occupied 2nd and 3rd places last month, into 3rd and 4th places. Chicago and Cincinnati chapters exchanged places, with Chicago going into 5th place. Central Indiana and Northern California chapters also exchanged places, while Metropolitan made a big jump from 16th to 9th place. Michiana advanced one place, to 10th, and Birmingham chapter fell from 9th to 11th place. Quad City chapter jumped five places, from 17th to 12th, while Twin City chapter held its own in 13th place. Western New York dropped from 12th to 14th place and Central New York from 10th to 15th. Ontario held its own, while Southern California chapter was pushed down from 14th to 17th place. Northeastern Ohio chapter jumped two places, from 20th to 18th, and Philadelphia held its own in 19th place. Chesapeake dropped from 18th to last place, which was vacated by Detroit, now in 20th place. The St. Louis District chapter, although advancing in number of points, still remains in 21st place.

Let us see who took the palm this month for the largest number of new members. We predicted last month that Wisconsin would be a tough competitor and this month's list of new members bears out this prediction. Under the able direction of its chapter membership chairman, Bill Hambley, Allis-Chalmers Mfg. Co., West Allis, Wis., the Wisconsin chapter leads the parade this month with 17 new members, and Metropolitan and Northeastern Ohio chapters are next with 11 new members each. It was interesting to note that 20 of the 22 chapters obtained new members during the past month.

Remembering the slogan of the National Membership Committee, "5000 in '42," the National Membership Committee, under the chairmanship of B. D. Claffey, General Malleable Corp., Waukesha, Wis., and E. W. Horlebein, Gibson & Kirk Co., Baltimore, as his vice chairman, pointed out that in order to attain this goal, it would require only 25 new members per month from each chapter. The committee realizes that everyone is extremely busy with war work, but never has an opportunity presented itself where the American Foundrymen's Association could be of more value to the industry than during the present crisis. Therefore, members are doing non-members a distinct favor by inviting them to membership in the American Foundrymen's Association, as the information gained will aid them in producing more and better castings to aid in the attainment of our final goal of complete victory over our enemies.

Chapter Membership Progress Report

Chapter		Membership as of 7/1/41	Chapter Quotas	Gain in Membership as of 1/15/42	Chapter Standing By Points
1	Western Michigan	50	68	28	389
2	Toledo	43	60	17	300
3	Nor. Illinois-Sou. Wisconsin	40	46	10	278
4	Wisconsin	310	210	74	234
5	Chicago	425	259	47	169
6	Cincinnati District	141	141	20	161
7	Central Indiana	127	111	15	145
8	Northern California	107	99	12	116
9	Metropolitan	172	210	22	115
10	Michiana	67	101	15	108
11	Birmingham District	242	125	15	104
12	Quad City	129	41	5	91
13	Twin City	66	84	11	74
14	Western New York	151	111	9	70
15	Central New York	109	90	5	60
16	Ontario	98	199	12	51
17	Southern California	194	201	10	49
18	Northeastern Ohio	328	243	14	46
19	Philadelphia	185	237	5	38
20	Detroit	231	196	1	36
21	St. Louis District	135	90	*0	27
22	Chesapeake	154	159	7	19
		3504		354	

*While a chapter may show no increase in membership, it is possible to show a gain in the *Chapter Standing by Points* column by converting a personal to a company membership or a company to a sustaining membership, since each class of membership carries a different credit in points.

The above figures do not include membership of non chapter areas.

Cost Factor Comparison Report Now Ready

AT the 1941 New York Convention, the A.F.A. Cost Committee presented a report on an extensive study that it had made over a period of several years dealing with a comparison of foundry cost classifications for gray iron, malleable, steel and non-ferrous foundries. The study covers the factors involved in determining melting, molding, core, cleaning and finishing department costs as well as those of miscellaneous departments, such as heat treating and pattern. This report now is available in pamphlet form.

All divisions of A.F.A. are represented on the committee, and also the trade associations representing the various divisions of the industry. As this is the first time such cost factor comparison information has been published in pamphlet form, here is an opportunity to supply the members of your cost department with interesting information.

This comparison of foundry cost classification factors is available to members at $0.50 per copy and at $1.00 per copy to non-members.

New Members

The keen competitive spirit among the twenty-two Association chapters for the membership prizes is clearly illustrated by this month's list of new members. Twenty chapters signed one or more new members for their records and "5000 in '42." The Association extends a hearty welcome to the following new members and appreciates the great co-operation the various chapter membership committees are showing.

December 16, 1941, to January 15, 1942

Conversions

Company from Personal

Jeffery Quest Foundry Co., Minneapolis, Minn. (J. F. Quest, President)

Birmingham District Chapter

***Southeastern Castings Co., Anniston, Ala. (C. C. Pope, Owner)**

Central Indiana Chapter

Albert R. Brauer, Owner, Brauer Foundry, Kokomo, Indiana

Chesapeake Chapter

Harry G. Hill, Sr., Quarterman, Washington Navy Yard, Washington, D. C.

Chicago Chapter

George Paul Antonic, Met., Steel Sales Corp., Chicago, Illinois

Louis Cinko, Foundry Foreman, American Steel Foundries, East Chicago, Ind.

James Mikuta, Supt., Manufacturers Brass Foundry Co., Chicago, Ill.

***Monaco Metal Foundry, Chicago, Ill. (John Monaco, Partner)**

Paul A. Pierce, Hull Supt., Continental Roll & Steel Foundry Co., East Chicago, Ind.

Cincinnati Chapter

Ray H. Lampe, Cincinnati, Ohio, Sales Engr., Harnischfeger Corp., Milwaukee, Wis.

Detroit Chapter

Minor L. Carpenter, Foreman, Cadillac Motor Car Co., Detroit, Mich.

****Chrysler Corporation, Detroit, Mich. (E. A. Petersen, Foundry Manager)**

Phelps Newberry, Jr., Detroit Steel Casting Co., Detroit, Mich.

Metropolitan Chapter

Bernard N. Ames, Jr. Met., U. S. Navy Yard, Brooklyn, New York

H. F. Biddle, Fdry. Supt., Foran Foundry & Mfg. Co., Flemington, N. J.

***Condenser Service & Engineering Co., Inc., Hoboken, N. J. (Wm. Maurer, Gen'l Supt.)**

****Foran Foundry & Mfg. Co., Flemington, N. J. (John F. Schenk, Vice President)**

***R. Hoe & Company, Inc., Dunellen, N. J. (Arthur J. Hart, Fdry. Mgr.)**

Edward Light, Molder, U. S. Navy Yard, Brooklyn, New York

Emil Oswald, Chief Fdry. Inspector, Eclipse Fdry. Div., Bendix Aviation Corp., Bendix, N. J.

Frank H. Placek, Met., R. Hoe & Company, Dunellen, New Jersey

Irving Rubin, Molder, U. S. Navy Yard, Brooklyn, New York

Milton Schoen, Molder, U. S. Navy Yard, Brooklyn, New York

Louis H. Ulffers, Supv.-Fdry. Ht. Treat., Eclipse Fdry. Div., Bendix Aviation Corp.

Michiana Chapter

George F. Biltz, Cupola Foreman, Dodge Manufacturturing Corp., Mishawka, Ind.

August A. Faller, Molding Foreman, Dodge Manufacturing Corp., Mishawaka, Ind.

Matthew Goodall, Jr., Foreman, Patt. Shop, Dodge Manufacturing Corp., Mishawaka, Ind.

Carl W. Petersen, Ass't Works Mgr., Dodge Manufacturing Corp., Mishawaka, Ind.

E. W. Shaw, Toledo, Ohio, Salesman, Freeman Supply Co., Toledo, Ohio

Northeastern Ohio Chapter

William Barry, Gen'l Mgr., Minco Products Co., Cleveland, Ohio

Cary Beals, Met., Forest City Foundries Co., Cleveland, Ohio

Mike Butcher, Core Room Foreman, Forest City Foundries Co., Cleveland, Ohio

Dave Clark, Core Room Foreman, Forest City Foundries Co., Cleveland, Ohio

Merle L. Crowell, Sales, Cleveland Chaplet & Mfg. Co., Cleveland, Ohio

John W. Hart, Supt. of Fdry., West Steel Casting Co., Cleveland, Ohio

A. L. Klingeman, Penton Publishing Company, Cleveland, Ohio

Anthony Mackay, Pay Master, West Steel Casting Co., Cleveland, Ohio

Chas. Seelbach, Vice Pres. and Gen'l Mgr., Forest City Foundries Co., Cleveland, Ohio

George Walton, Secretary, Madison Foundry Co., Cleveland, Ohio

J. J. Witenhafer, Lake City Malleable Co., Cleveland, Ohio

Northern California Chapter

H. E. Eggerts, Mgr., Berkeley Brass Foundry Co., Berkeley, Calif.

Northern Illinois-Southern Wisconsin Chapter

***Burgess-Parr Company, Freeport, Ill. (R. D. Pash, Treasurer)**

***Star Pattern & Model Works, Inc., Rockford, Ill. (Harold Hasselroth, Secretary)**

Ontario Chapter

Russell C. Vollick, Met. and Chief Chem., Canadian Westinghouse Co., Hamilton, Ont.

Philadelphia Chapter

Adolph J. Schuessler, Supt., Wilkening Mfg. Co., Philadelphia, Pa.

Quad-City Chapter

Thos. C. Hamlin, Jr., Moline, Ill., Rep., Midwest Foundry Supply Co., Edwardsville, Ill.

St. Louis Chapter

Carl W. Price, Foundry Supt., Liberty Foundry Co., St. Louis, Mo.

Southern California Chapter

George D. Smith, Pattern Shop, Kinney Iron Works, Los Angeles, Calif.

Toledo Chapter

George Blumke, Core Foreman, National Supply Co. of Delaware, Toledo, Ohio

***Magnesium Fabricators Div., Bohn Aluminum & Brass Corp., Adrian, Mich. (Leslie Brown, Plant Manager)**

Arthur Geo. Schill, Foreman, National Supply Co. of Delaware, Toledo, Ohio

Otto Schmidt, Patt. Shop Supt., National Supply Co. of Delaware, Toledo, Ohio

***H. G. Shook Company, Lima, Ohio (Don F. Shook, President)**

Norman Terbille, Supt., Binney Castings Co., Toledo, Ohio

**Sustaining Member.
*Company Member.

Western Michigan Chapter

R. C. Banks, Met., Battle Creek Foundry Co., Battle Creek, Mich.
Walter B. Millar, Supt., Battle Creek Foundry Co., Battle Creek, Mich.

Western New York Chapter

Alexander Boyd, Fdry. Foreman-Molding, Worthington Pump & Mach. Corp., Buffalo, N. Y.

Wisconsin Chapter

Imanuel Dapper, Fdry. Foreman, Nordberg Mfg. Co., Milwaukee, Wis.
George Dinges, Brass Met., Nordberg Mfg. Co., Milwaukee, Wis.
Walter Fuhs, Foreman, Universal Foundry Co., Oshkosh, Wis.
David J. Grabske, Foreman, Ampco Metal, Inc., Milwaukee, Wis.
Fred Judkins, Foreman, Universal Foundry Co., Oshkosh, Wis.
Arthur F. Juds, Milwaukee, Wis., E. I. duPont de Nemours & Co., Wilmington, Del.
Joseph Kaufman, Foreman, Universal Foundry Co., Oshkosh, Wis.
*Kearney & Trecker Corp., Milwaukee, Wis. (E. W. Trecker, Works Mgr.)
Anthony W. Kliebhan, Foreman, Ampco Metal, Inc., Milwaukee, Wis.
Al. Knaggs, Foreman, Universal Foundry Co., Oshkosh, Wisconsin
George Luther, Foreman, Universal Foundry Co., Oshkosh, Wis.
Ed. Nelson, Foreman, Universal Foundry Co., Oshkosh, Wisconsin
Joseph Peterik, Foreman, Universal Foundry Co., Oshkosh, Wis.
Irving Powell, Foreman, Ampco Metal, Inc., Milwaukee, Wis.
Otto Sadofsky, Foreman-Core Room, Mid-City Foundry Co., Milwaukee, Wis.
Frank Vogt, Foundry Dept., Bucyrus-Erie Co., South Milwaukee, Wis.
William H. Walter, Engineer, Ampco Metal, Inc., Milwaukee, Wis.

Outside of Chapter

E. Beutelspacher, Libreria Cervantes, Buenos Aires, Argentina, S. A.
James Brinn, Supt., Northwestern Iron & Metal Company, Lincoln, Neb.
Curio Chiaraviglio, Mgr., Chiaraviglio Hnos S.R.L., Buenos Aires, Argentina, S. A.
Ferrosmalt, S. A., Montevideo, Uruguay, S. A.
The Manager, Engineering Dept., H. M. Dockyard, Portsmouth, Hants, England
W. J. Lamont, Esq., South African Iron & Steel Corp., Iscor Works, Pretoria, Union of South Africa
Norman Lillycrop, Gibson, Battle & Co., Pty., Ltd., Sydney, N. S. W., Australia
Gilbert S. Schaller, Prof. Mech. Eng., University of Washington, Seattle, Wash.

Many Local Apprentice Contests Are Being Held

PLANNING on getting winners in the national apprentice molding and pattern contest, local groups and plants have already started their elimination competitions.

Blue prints for the pattern makers and patterns for the molding groups have been made available by the A.F.A. committee. The committee is indebted to the management of the Caterpillar Tractor Company, Peoria, Ill., for supplying several sets of patterns for steel, gray iron and non-ferrous competition.

A larger number of groups and individual companies than ever before have already entered their apprentices this year. Other companies may have their apprentices take part by writing the Apprentice Committee, American Foundrymen's Association, 222 W. Adams Street, Chicago.

The A.F.A. Awards Board is providing funds for 1st, 2nd, and 3rd prizes for the winners in each of the four groups, namely steel molding, gray iron molding, non-ferrous molding and pattern making. Since these contests were first established in 1925 they have done a great deal to stimulate interest in organized training on the part of foundrymen, and the displays of entries at the annual convention have been a source of discussion as to the best methods used by the various apprentices in producing the patterns and castings displayed.

The patterns entered in the 1941 convention competition have been critically reviewed by Frank Cech, Cleveland Trade School, with his review being published in the January, 1942, issue of the *American Foundryman*. Through the courtesy of Mr. Cech and the Cleveland Trade School, these patterns have been arranged for shipment to the A.F.A. chapters which are having the display examined by gatherings of patternmaker members.

An Old Timer Presents 75 Years' Foundry Service

THE Malleable Iron Fittings Co., Branford, Conn., is justifiably proud of its secretary, Lester J. Nichols, who, on August 13, 1941, celebrated his 75th year of service with the company. At 92 he says he is too busy to retire and that he would not think of doing so until he is 100.

A year after the end of the Civil War, Mr. Nichols, at the age of 17, went to work for the Malleable Iron Fittings Co. as a clerk, when the plant was only two years old and had a capacity of a ton of castings. Working in various capacities, he now is secretary, assistant treasurer and a member of the board. Mr. Nichols has seen the company grow to its present size, turning out over 6,000 tons of pipe fittings, 7,500 tons of malleable castings and 5,000 tons of steel castings a year.

Lester J. Nichols, The Malleable Iron Fittings Co., Branford, Conn., who has celebrated his 75th year with this company.

Regional Conferences

Wisconsin Conference to Present Many Features

By George Pendergast,* Milwaukee, Wis.

THE fifth annual Regional Foundry Conference, under the joint auspices of the Wisconsin chapter and the University of Wisconsin, will be held at the Schroeder Hotel, Milwaukee, Thursday and Friday, February 26 and 27.

An innovation of this year's Wisconsin Conference, which is expected to attract the largest attendance to date, will be the active participation of Wisconsin patternmakers on the program. A joint meeting will be devoted to pattern shop prob-

*Geo. M. Pendergast & Co., Inc., and Chairman, Publicity Committee, Wisconsin Regional Conference.

Schedule of Sessions -- Wisconsin Regional Conference Hotel Schroeder, Milwaukee, February 26 and 27

Thursday, February 26

11:00 a. m.-12:00—Registration, Hotel Schroeder
12:15 p. m.-2:00 p. m.—Luncheon, Crystal Ball Room
1:30 p. m.-2:00 p. m.—Welcoming Address
Professor F. E. Johnson, Dean, Engineering College, University of Wisconsin, Madison
2:00 p. m.-3:15 p. m.—Joint Meeting
Chairman, A. M. Fisher, Chas. M. Jurack Co., Milwaukee
Speaker, A. F. Pfeifer, Allis-Chalmers Mfg. Co., Milwaukee
"Pattern and Casting Relationships"
3:30 p. m.-5:00 p. m.—Gray Iron
Chairman, A. C. Haack, Wisconsin Gray Iron Foundry Co., Milwaukee
Speaker, John Lowe, Battelle Memorial Institute, Columbus, Ohio
"Melting Practices"
3:30 p. m.-5:00 p. m.—Malleable
Chairman, M. Harder
Speaker, Wm. Buchholtz, Belle City Malleable Iron Co., Racine
"Core Clinic"
3:30 p. m.-5:00 p. m.—Steel
Chairman, W. F. McKee, Key Co., St. Louis, Mo.
Speakers, L. E. Everett, Kaukauna Machine Corp., Kaukauna, and George Anderson, Bucyrus Erie Co., Milwaukee
"Steel Casting Design in Relation to Quality and Cost"
3:30 p. m.-5:00 p. m.—Non-Ferrous
Chairman, A. K. Higgins, Allis-Chalmers Mfg. Co., Milwaukee
Speaker, W. K. Evans, Priorities Division, O.P.M., Chicago, Ill.
"Priorities and Allocations"
7:00 p. m.—Dinner, Crystal Ball Room
Address by nationally known speaker

Friday, February 27

9:00 a. m.-10:15 a. m.—Gray Iron
Chairman, L. E. Everett, Kaukauna Machine Corp., Kaukauna
Speaker, N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio
"Recent Developments in Cores and Molding Sands"
9:00 a. m.-10:15 a. m.—Malleable
Chairman, E. B. Hansen, Wisconsin Appleton Co., Milwaukee
Speaker, James Lansing, Malleable Founders' Society, Cleveland, Ohio
"Casting Design"
9:00 a. m.-10:15 a. m.—Steel
Chairman, H. Hoffman
Speakers, R. Blum, Ladish Drop Forge Co., Cudahy, and E. J. Wellauer, Falk Corp., Milwaukee
"Magnaflux Testing"
"Gamma Rays and X-ray"
9:00 a. m.-10:15 a. m.—Non-Ferrous
Chairman, J. C. Stern, Ampco Metal, Inc., Milwaukee
Speaker, (to be announced), Castings Pattern Corp., Chicago, Ill.
"Plaster Molding"
10:30 a. m.-12:00—Gray Iron
Chairman, A. C. Haack, Wisconsin Gray Iron Foundry Co., Milwaukee
Speaker, Wm. A. Hambley, Allis-Chalmers Mfg. Co., Milwaukee
"Casting Defects"
10:30 a. m.-12:00—Malleable
Chairman, E. P. Meyer, Chain Belt Co., Milwaukee
Speaker, Carl Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.
"'ArmaSteel'—Defense Material"
10:30 a. m.-12:00—Steel
Chairman, J. Wettergreen, Bucyrus Erie Co., Milwaukee
Speaker, Harry Dietert, H. W. Dietert Co., Detroit, Michigan
"Behavior of Steel Facing Sands and Core and Mold Washes at Elevated Temperatures"
10:30 a. m.-12:00—Non-Ferrous
Chairman, J. C. Stern, Ampco Metal, Inc., Milwaukee
Speakers, W. Edens, Ampco Metal, Inc., Milwaukee, and H. Zuehlke, Allis-Chalmers Mfg. Co., Milwaukee
"Centrifugal Castings"
12:15 p. m.-1:30 p. m. — Luncheon Meeting, Crystal Ball Room
Chairman, Professor J. F. Oesterle, University of Wisconsin, Madison
Speaker, President Dykstra, University of Wisconsin, Madison
1:45 p. m.-3:20 p. m.—Gray Iron
Chairman, L. E. Everett, Kaukauna Machine Corp., Kaukauna
Speaker, H. C. Aufderhaar, Electro Metallurgical Co., Chicago, Ill.
"High Test and Alloy Castings"
1:45 p. m.-3:20 p. m.—Malleable
Chairman, L. Harkrider, General Malleable Corp., Waukesha
Speaker, W. D. McMillan, International Harvester Co., Chicago, Ill.
"Recent Developments in Annealing Malleable Iron"
1:45 p. m.-3:20 p. m.—Steel
Chairman, D. C. Zuege, Sivyer Steel Casting Co., Milwaukee
Speaker, F. A. Melmoth, Detroit Steel Casting Co., Detroit, Mich.
Subject to be announced later
1:45 p. m.-3:20 p. m.—Non-Ferrous
Chairman, A. K. Higgins, Allis-Chalmers Mfg. Co., Milwaukee
Speaker, A. C. Busch, Chas. C. Kawin Co., Chicago
"Gates and Risers"
3:30 p. m.—Joint Meeting, Crystal Ball Room
Speaker to be announced later

lems, while next year the patternmakers are expected to have complete sectional sessions for each day of the Conference.

Howard C. Waldron, Nordberg Mfg. Co., is chairman of the 1942 Conference, while Professor J. F. Oesterle, University of Wisconsin, is co-chairman. Other members of the Regional Conference committee are: A. C. Ziebell, Universal Foundry Co., Oshkosh, Wis., President, Wisconsin chapter; R. F. Jordan, Sterling Wheelbarrow Co., Milwaukee; G. K. Dreher, Ampco Metal, Inc., Milwaukee; W. A. Hambley, Allis-Chalmers Mfg. Co., West Allis; D. C. Zuege, Sivyer Steel Casting Co., Milwaukee; F. A. Pritzlaff, Falk Corp., Milwaukee; John Bing, A. P. Green Firebrick Co., Milwaukee; T. E. Ward, Badger Malleable & Mfg. Co., South Milwaukee; Harry E. Ladwig, Allis-Chalmers Mfg. Co., West Allis; B. D. Claffey, General Malleable Corp., Waukesha; R. M. Jacobs, Standard Brass Works, Milwaukee; Walter Gerlinger, Walter Gerlinger, Inc., Milwaukee; George M. Pendergast, George M. Pendergast & Co., Milwaukee; C. Haack, Wisconsin Gray Iron Foundry Co., Milwaukee; L. E. Everett, Kaukauna Machine Corp., Kaukauna, Wis.; L. V. Tuttle, Koehring Co., Milwaukee; R. C. Woodward, Bucyrus Erie Co., South Milwaukee; C. F. Haertel, Falk Corp., Milwaukee; Paul C. Power, Maynard Electric Steel Casting Co., Milwaukee; Professor E. R. Shorey, University of Wisconsin, Madison, Wis.; D. I. Dobson, General Malleable Corp., Waukesha; Stephen Pohl, Federal Malleable Co., West Allis; Arthur K. Higgins, Allis-Chalmers Mfg. Co., West Allis; J. C. Stern, Ampco Metal, Inc., Milwaukee; A. M. Fischer, Chas. M. Jurack Co., Milwaukee; and R. G. Metzger, Nordberg Mfg. Company, Milwaukee.

The Conference will open with registration from 11:00 a. m. to noon on February 26. This will be followed by a luncheon in the Crystal Ball Room, Schroeder Hotel, at which the welcoming address will be by Professor F. E. Johnson, Dean of the College of Engineering, University of Wisconsin.

The joint meeting for the patternmakers will follow the luncheon and will be addressed by Albert F. Pfeifer, superintendent of pattern shops, Allis-Chalmers Mfg. Co., West Allis, Wis., on "Pattern and Casting Relationships."

Following the afternoon sectional sessions there will be a dinner in the Crystal Ball Room, at which a nationally known speaker will deliver the principal address.

Tenth Annual Foundry Meeting at Birmingham

THE Birmingham District chapter has announced a tentative program for its Tenth Annual Foundry Practice Conference to be held in the Tutwiler Hotel, Birmingham, Ala., February 19-21. This year's conference makes the Birmingham District chapter the sponsor of the oldest and most often held regional conference among the chapters of A.F.A. Each year the Birmingham District chapter does an outstanding piece of work in creating the program for its conference. It has built up an enviable reputation and this conference now is recognized as the largest group activity among the southern foundrymen. Noted for their fine hospitality, southern style, members of the Birmingham District chapter outdo themselves for this particular event each year. The results are indicated by the large attendance, between 700 and 800, which have become common for these conferences over the past years. The chapter looks forward to even a larger attendance this year. In the accompanying box will be found the tentative program for the conference.

Birmingham District Chapter

Tenth Annual Foundry Practice Conference

Tutwiler Hotel, Birmingham, Ala., February 19-21

Thursday, February 19

9.00 a.m. Registration—Tutwiler Hotel

10:00 a.m. *"Increasing Production in the Foundry with Existing Equipment"*

12:30 p.m. Annual Luncheon

2:00 p.m. *"Sand and Sand Control"*

4:00 p.m. *"Patterns and Pattern Making"*

7:30 p.m. Dinner and Entertainment

Friday, February 20

9:00 a.m. Plant Visitation

2:00 p.m. *"Foundry Metallurgy"*

4:00 p.m. *"Foundry Quiz Program"*

7:30 p.m. Annual Banquet

Saturday, February 21

9:00 a.m. Plant Visitation

Warning to Northeastern Ohio Chapter Members

IT has been brought to the attention of the National office of the Association that members of the Northeastern Ohio chapter are being approached by a photograph service. These "racketeers" are representing themselves as having been authorized by either the National office of the American Foundrymen's Association or the Northeastern Ohio chapter to get your photograph. THIS IS NOT TRUE and if your picture is required you will be in receipt of a personal letter from the National office of the American Foundrymen's Association or officers of the Northeastern Ohio chapter. In the absence of such a letter any photographs ordered will be at your own risk.

The Honor Roll

THE following companies have been awarded the Navy "E," the coveted symbol of efficiency, excellence and achievement awarded for conspicuous co-operation and production of material for the United States Navy. Those companies whose names are printed in italics operate foundry departments, while those printed in bold-face type produce castings as their major product:

Arma Corporation, Brooklyn, N. Y.
Bausch & Lomb Optical Co., Rochester, N. Y.
Cameron Iron Works, Houston, Texas.
E. I. DuPont de Nemours & Co., Inc., Wilmington, Del.
Fisher Body Division, General Motors Corp., Detroit, Mich.
Ford Instrument Co., Long Island City, N. Y.
International Nickel Co., Huntington, W. Va.
Keuffel & Esser Co., Hoboken, N. J.
Midvale Co., Nicetown, Philadelphia, Pa.
Miehle Printing Press & Mfg. Co., Chicago, Ill.
Norris Stamping & Mfg. Co., Los Angeles, Calif.
Northern Pump Co., Minneapolis, Minn.
Pollak Mfg. Co., Arlington, N. J.
Textile Machine Works, Reading, Pa.
Bantam Bearings Corporation, South Bend, Ind.
Consolidated Machine Tool Corp., Rochester, New York.
Eclipse Machine Div., Bendix Aviation Corp., Elmira, N. Y.
Erie Forge Co., Erie, Pa.
Lakeside Bridge & Steel Co., Milwaukee, Wis.
Lansdowne Steel & Iron Co., Morton, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Standard Steel Works Div., Baldwin Locomotive Works, Burnham, Pa.
The Carrier Corporation, Syracuse, N. Y.
The Erie Works, General Electric Co., Erie, Pa.
Westinghouse Elec. Elevator Co., Jersey City, New Jersey.
American Locomotive Co., Schenectady, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Carnegie-Illinois Steel Co., Homestead, Pa.
Continental Gin Co., Birmingham, Ala.
Crucible Steel Company of America, Harrison, N. J. (Crucible Steel Midland Plant, Midland, Pennsylvania).
Goss Printing Press Co., Chicago, Ill.
Heppenstall Company, Pittsburgh, Pa.
Ingersoll Milling Machine Co., Rockford, Ill.
National Forge & Ordnance Co., Irvine, Pa.
SKF Ball Bearing Company, Philadelphia, Pa.
The Monarch Machine Tool Co., Sidney, Ohio.
Triumph Explosives, Inc., Elkton, Md.
Vickers, Inc., Detroit, Mich.
Sandusky Foundry & Machine Co., Sandusky, Ohio
Kropp Forge Co., Chicago, Ill.

Navy "E" Presented to Sandusky Foundry Co.

ON December 13, 1941, the Sandusky Foundry & Machine Co., Sandusky, Ohio, was awarded the coveted Navy "E." This award is made by the Bureau of Ordnance, U. S. Navy, for conspicuous co-operation and effective production of material for the Navy. It is a symbol of efficiency, excellence and achievement, and is the highest service award the Navy bestows. The award is the Navy's way of saying, "Well done!"

The Navy "E" consists of the flag of the Navy Bureau of Ordnance, flown at the company's masthead, above a blue pennant on which is mounted a white "E." Some 40 companies scattered from the Atlantic to the Pacific have thus far received this signal honor. As far as it has been possible to determine, the Sandusky Foundry & Machine Co. is the first company on which this award has been conferred whose major product is castings. The Sandusky company employs about 250 and produces its castings by the centrifugal process. One of its major products is propeller shaft sleeves for ships.

The idea of honoring manufacturers and workers for exceptional production efforts in the manufacture of material for the Navy Department was promulgated by Rear Admiral W. H. P. Blandy, Chief, Bureau of Ordnance, U. S. Navy. The idea was enthusiastically endorsed by the Secretary of the Navy and heartily approved by the President.

As authorized by the President of the United States and directed by the Secretary of the Navy, those manufacturing companies which qualify are permitted to fly the Ordnance Flag and Navy "E" Pennant over their plant, and all employees of such plants are awarded an emblem in the form of a lapel button bearing the Navy insignia.

The Ordnance Flag is dark blue with a diamond shaped area of red in the center. In the diamond shaped red area is the insignia of the Bureau of Ordnance, U. S. Navy.

The presentation of the Navy Ordnance Flag and Navy "E" to the Sandusky Foundry & Machine Co. was held in the Junior High Auditorium, Sandusky, Ohio, and was attended by high ranking Navy officers, Commanding Officer of Plum Brook Ordnance Works and his staff, City and State officials, heads of other Sandusky industries, and a number of other distinguished guests. Presentation ceremonies were broadcast over Station WTAM, Cleveland, and the presentation of the award was made by Rear Admiral Wat T. Cluverius, U.S.N. (Ret.) The award was accepted on behalf of the Sandusky Foundry & Machine Co. by Devereux Lake, its president. Navy "E" buttons were presented to employees of the company by Captain R. P. Schlabach, U.S.N., Inspector Naval Material, Cleveland District. The guest of honor was Mrs. Robert Grace Denig, widow of the late Commodore Denig, Sandusky, Ohio, who attended the brilliant ceremony.

Past Director Peregoy Dies at Milwaukee Home

THE Association regrets to announce the death of Past Director Lamar S. Peregoy, president, Sivyer Steel Casting Co., Milwaukee. Mr. Peregoy, who was 54 years old, served as a Director of the American Foundrymen's Association for the years 1935, 1936 and 1937 and as a member of the Board of Directors Executive Committee. He was a long and valued member of the Association, entering into its activities and supporting its endeavors.

Born in Davenport, Iowa, Mr. Peregoy attended the schools of Milwaukee, the city where he spent his entire industrial career. In 1905, he entered the employ of the Northwestern Malleable Iron Co., Milwaukee, and remained with this organization until 1909, at which time he became affiliated with the Sivyer Steel Casting Co. Since 1909, he held various executive and managerial positions with the company, culminating in his election to the presidency.

Mr. Peregoy was active in many organizations dealing with the foundry industry. His death is a distinct loss both to the Association and that industry.

Students Pledge Money to Cupola Research Fund

FOR being in operation approximately six months, the Minnesota University Student chapter has indeed made a unique mark in Association activities. For some time the Student chapter has been studying the activities of the Association in order to find a place where they could co-operate in doing the most good, collectively or individually. After due deliberation the students decided that they could best help by contributing financially to the Cupola Research Committee. It was passed by the members of the Student chapter that they would contribute $5.00 a year for four years as their part in this program. It was felt by the students that this investigation can do more for the Association and the industry in imparting practical knowledge on cupola operation to the operators of cupolas and the mass of American foundrymen.

Those students who are making this contribution possible are Jarl A. Havnen, *president;* Sidney S. Silberg, *secretary-treasurer;* and the following student members: James H. Anderson, Eugene Blair, Fred Brandt, Leo J. T. Brom, Henry R. Dahlberg, Elmer S. Dinesen, Gilbert Falck, Rossell Gunderson, D. J. Johnson, LeRoy Kelman, Merle Kinkela, Carl W. Magnuson, Howard W. Nicol, George F. Pearson, Howard M. Tomasko and John Appgren.

Faculty sponsors for this organization are Fulton Holtby, assistant professor, department of mechanical engineering, and H. F. Scobie, instructor, foundry practice.

A few of the activities engaged in by the chapter include helping Professor Holtby in his cupola research work, holding one dinner meeting per month at which some outstanding local foundryman speaks, and putting on a demonstration of molding, melting and pouring in the University foundry in conjunction with the annual Engineer's Day celebration at the University.

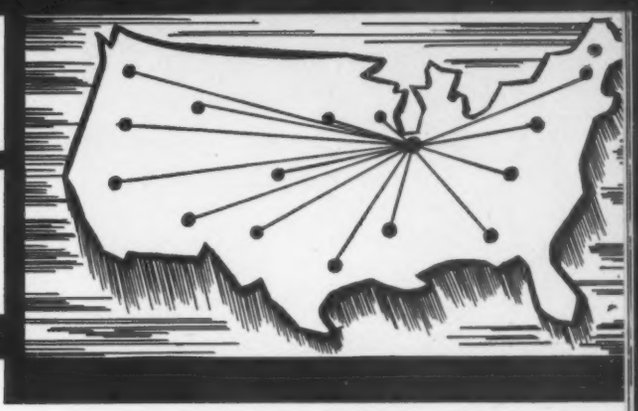
Non-Ferrous Division Nominates Officers

THE Nominating Committee of the Non-Ferrous Division appointed by Division Chairman W. J. Laird, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has recently submitted their report.

After balloting, the following have been nominated: *For Chairman for Two Years* — William Romanoff, H. Kramer & Co., Chicago; *for Vice Chairman for Two Years*—C. V. Nass, Fairbanks Morse & Co., Beloit, Wis.; members of the Executive Committee to Serve for Four Years—Dr. N. E. Woldman, Eclipse Aviation Division, Bendix Aviation Corp., Bendix, N. J.; E. J. Metzger, Falcon Bronze Co., Youngstown, Ohio; and R. J. Keeley, Ajax Metal Corp., Philadelphia, Pennsylvania.

A few of the members of the Minnesota University Student chapter. This picture was taken during Christmas vacation and the entire membership is not represented, but they are: Top row (left to right)—Fred Brandt, Jarl Havnen, Gordon Harstad, Gilbert Falck, and LeRoy Kelman. Bottom row (left to right)—Sid Silberg, Henry Dahlberg, Elmer Dinesen, Rossell Gunderson and Leo Brom.

Chapter Activities



Central New York Holds Large Christmas Party

By L. E. Hall,* Syracuse, N. Y.

THE Christmas party of the Central New York chapter, held on December 12, at the Onondaga Hotel, Syracuse, N. Y., was well attended by one hundred and forty members.

An excellent buffet supper was provided in the Roof Garden of the hotel where the party was staged. In addition to the excellence and variety of food from which to choose, a feature which many appreciated was the serving of hot clam-chowder and coffee at the tables. Food was available from seven until nine, after which Chapter Chairman Lloyd Wright, U. S. Radiator Corp., Geneva, N. Y., thanked the committee who arranged the party for the time and effort spent in this cause. The committee members were Messrs. Hook, *chairman;* White, Dunn, Comstock, Shortsleeve, McBride, LaBoiteaux and MacLean.

Mr. Hook was introduced and he in turn introduced Harry Stone, master of ceremonies, Joey Val Entertainers of Rochester. This troupe of entertainers provided a complete program.

*Syracuse Chilled Plow Co., and Secretary, Central New York chapter.

Philadelphia's Christmas Party and January Chapter Meeting

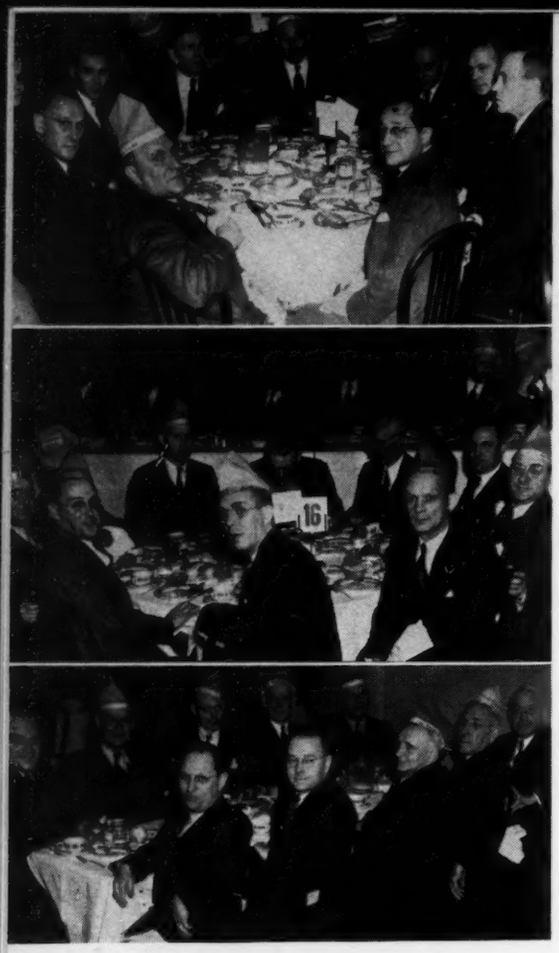
By B. H. Bartells,* Philadelphia, Pa.

MORE than 500 members and friends of the Philadelphia chapter attended the chapter's Annual Christmas Party held on Wednesday evening, December 17, at the Philadelphia Hotel. The party was a great success and will be remembered as one of the high lights of Philadelphia chapter activities. The ball room of the hotel, where the party was held, gave the appearance of a night club, tables for ten being arranged around the stage. A delicious turkey dinner was served and enjoyed by all.

After the dinner, an excellent floor show, arranged by the Entertainment Committee headed by John M. Robb, Jr., Hickman Williams & Co., proved to be

*University of Pennsylvania, and Reporter, Philadelphia chapter.

Personalities present at the Central New York Christmas party. In the upper right hand corner is the Christmas Party Committee, which was responsible for the party's success. Front row (left to right)—A. J. McBride, F. C. Wheeler, E. G. White, F. F. Shortsleeve and E. E. Hook. Back row (left to right)—W. D. Dunn, Walter Jones, H. H. Comstock and A. J. LaBoiteaux. J. P. McLean, the other member of the committee, was not present.



The Philadelphia chapter says their Christmas party was the best yet and these pictures are ample evidence.

one of the best in recent years. The party was one of the most successful in the history of the Philadelphia chapter.

January Meeting

Non-Ferrous night was observed by the Philadelphia chapter at the January meeting held on Friday evening, January 9, at the Engineers Club.

Dinner was served to approximately one hundred and seventy-five members and friends of the chapter. Chapter Chairman Harry Reitinger, U. S. Pipe & Foundry Co., Burlington, N. J., presided.

The after dinner speaker, Dr. Phillip J. Steinmetz, Rector of St. Paul's Church, Elkins Park, Pa., gave a very interesting and inspiring talk on "Common Sense and Courage." Dr. Steinmetz has addressed the chapter on other occasions.

The technical session was devoted to a discussion of non-ferrous problems. Edwin W. Horlebein, Gibson & Kirk Co., Baltimore, Md., and chairman, Chesapeake Chapter, was technical chairman of the session and introduced the main speaker, D. Frank O'Connor, Divisional Superintendent, Walworth Co., Boston, Mass.

Mr. O'Connor spoke on "Defects in Pressure Castings," dealing principally with red brass alloys. Various causes of porosity found in non-ferrous castings were discussed in detail and remedies suggested for the prevention of these defects. With the aid of numerous samples of defective castings, Mr. O'Connor traced the causes of porosity to various sources such as core sand, melting methods, ladles, oxides, etc. The speaker also stressed the need of proper supervision and control of pouring temperature and molding technique. The meeting proved to be one of the most interesting and instructive sessions ever held by the Philadelphia chapter.

St. Louis Features Round Table Meeting

J. W. Kelin,* St. Louis, Mo.

THE January 8 meeting held at the DeSoto Hotel was quite well attended despite the very inclement weather. Chapter Chairman Carl Morken, Carondelet Foundry Co., presided over the meeting.

Of special interest was the report by the Apprentice Training Committee Chairman L. A. Kleber, General Steel Castings Corp., Granite City, Ill., who outlined, in some detail, plans for the apprentice contest to be held in connection with the National Contest at Cleveland in April. Emphasis was placed on the importance of enrolling apprentices in the contest.

Program Committee Chairman L. J. Desparois, Pickands Mather & Co., directed attention to the February meeting which would be held on Friday, February 13, instead of the second Thursday of the month. This was done to make possible a joint meeting with the Steel Founders' Society.

Following the business meeting the men broke up into various groups for the sectional meetings. The steel men had for their speaker D. B. Reeder, Electro Metallurgical Co., Chicago, Ill. Mr. Reeder spoke on "Melting of Steel in Electric Furnace and Open Hearth" while discussion was led by F. B. Riggan, Key Co., St. Louis. In the gray iron session John Lowe, Battelle Memorial Institute, Columbus, O., talked on "Cupola Practice." Carl H. Morken, Carondelet Foundry Co., St. Louis, was the discussion leader. Speaker for the non-ferrous group was E. D. Mooney, Federated Metals Div., American Smelting & Refining Co., Whiting, Ind., and the discussion leader was Francis O'Hare, Central Brass & Aluminum Co., St. Louis.

These various sessions were well attended and splendidly led by the speakers and leaders.

*Federated Metals Div., A. S. & R. Co., and Secretary-Treasurer, St. Louis District chapter.

Central New York Chapter officers who were present at the Christmas party. They are (left to right)—E. G. White, treasurer; L. E. Hall, secretary; N. H. Boardman, vice chairman, and L. D. Wright, chairman.

A shot of the Philadelphia chapter officers seated at the speaker's table during the Christmas party.

Central Indiana Party and January Meeting

By R. A. Thompson,* Indianapolis, Ind.

CENTRAL Indiana Chapter held its first Christmas Party with results which were certainly gratifying. Perhaps the splendid success of our September outing should have told us that the Christmas Party would be equally successful. The Washington Hotel, Indianapolis, was chosen for the party and O. E. Murphy, Hickman Williams & Co., and his committee put on an affair which brought out over 160. No speaker, just fun and eats were the order of the day. Murphy and his gang provided a delicious "buffeteria" dinner, for Murphy, a transfer from Rockford, knew all the joys of a smorgasbord dinner as put on by the Swedes of Northern Illinois. The floor show was a treat and all felt that this party should be repeated each year.

Personnel Relations at January Meeting

For the regular meeting of our chapter, January 5, following a policy of having one meeting a year dealing with personnel relations, the chapter was fortunate in securing Charles P. Jones, general superintendent, Wm. H. Block Co., Indianapolis, as the speaker. Chairman H. B. Harvey, Indiana Foundry Corp., Muncie, in opening the session, introduced Duncan P. Forbes, president, Gunite Foundries Corp., Rockford, Ill., as the vice president of A.F.A. Mr. Forbes, in his official capacity with the Association, reviewed the plans for the Association's annual convention and Ordnance and Foundry Equipment Exhibit. He told of the broadening of the convention to make it the First Western Hemisphere Foundry Congress. Chairman Harvey then turned the meeting over to I. R. Wagner, Electric Steel Casting Co., the first chairman of the chapter, who presided during the rest of the evening. Mr. Wagner introduced Mr. Jones, who discussed personnel relation problems, responsibilities as a supervisor, his attitude and ways and means of securing best results from the efforts of industrial workers. Mr. Jones, who has had long experience with several companies in personnel work, showed how the personnel relations were basically the same in any industry or business. His talk was found to be very practical and all present got many pointers to apply in their own work.

*Electric Steel Castings Co., and Secretary, Central Indiana chapter.

Woodliff on Western Michigan Sand Program

By Max A. Amos,* Muskegon, Michigan

THE Western Michigan chapter held its regular monthly meeting on January 5 at the Occidental Hotel, Muskegon, Mich., with about fifty foundrymen in attendance. The presiding officer, due to the absence of Chairman Seyferth, was Vice Chairman C. J. Lonnee, Muskegon Piston Ring Co., Sparta Division, Sparta, Mich. Vice Chairman Lonnee acted as the program chairman as he introduced the lecturer.

The speaker of the evening, Earl Woodliff, Harry W. Dietert Co., Detroit, Mich., gave an in-

*Standard Automotive Parts Co., and Secretary-Treasurer, Western Michigan chapter.

Personalities at the Pittsburgh Foundrymen's Association Christmas party.
(Photos courtesy S. N. Farmer, Sand Products Corp., Cleveland, Ohio.)

teresting and informative talk on molding sand problems. Mr. Woodliff emphasized that the man selected for routine testing of sand should have foresight and be able to anticipate coming troubles before they actually arrive. An interesting statement made by the speaker was the proven fact that fines do not accumulate, but are almost entirely all present in the new sand before going into use. He also cautioned foundrymen not to try to change sand properties too rapidly but rather to make small changes daily, and that by making complete physical tests on new sands coming in, it is possible to predict probable results and compensate accordingly.

Following the question period, A. E. Jacobson, Grand Haven Brass Foundry, Grand Haven, Mich., showed kodachrome movies of a trip taken by him through the Carribean Islands to Dutch Guinea and Venezuela.

O'Connor Addresses New York Non-Ferrous Group

By K. A. DeLonge,* New York, N. Y.

"NOW, as never before, it is necessary for the foundry to come into its own," stated D. Frank O'Connor, divisional superintendent, Walworth Company, Boston, Mass., in addressing a group of 95 guests and members on the subject of "Non-Ferrous Pressure Castings" at the meeting of the Metropolitan chapter, January 5, at the Essex House, Newark, N. J. "It is fortunate," said Mr. O'Connor, "that the foundry industry does not avail itself of the opportunity to place men with technical training in charge of the actual operations in the foundry. The production of good castings is the direct responsibility of the men in charge of molding, melting, and pouring, and increased attention to these jobs will result in a higher yield of good castings." The speaker related the success of his company in educating the molders and foundry helpers in the requisites of their respective jobs, with a resulting increase in the quality of castings they helped to produce.

Mr. O'Connor stated their output normally included a number of different non-ferrous alloys, and that in all cases they have found it decidedly advantageous to keep daily records regarding sand, melting, and pouring conditions. Melting is done in open flame type furnaces which are kept slightly oxidizing. The importance of drying out a furnace after it has been repaired, and before it is put back into service was emphasized. Mr. O'Connor indicated that if this precaution is not taken the result might be as much as two days of gassy castings due to hydrogen. He also stated they preferred not to soak heats at temperature since this, too, resulted in hydrogen pick-up and blowholes in the castings.

With reference to pouring practice, the need of preheating ladles to a temperature as high as that of the metal was suggested. Refractory ladle liners insulated from the ladle shell by one-half-in. of insulation, reduces the metal temperature loss during pouring from as much as 100°F., using a clay lining to about 10 to 40°F. The use of charcoal in the ladle to prevent oxidation is satisfactory, but it is important to make sure that the charcoal is absolutely dry. Mr. O'Connor recommended a pouring temperature range of 2150 to 2250°F. for light and medium castings, and 2100°F. for heavy castings.

In regard to molding practice, the speaker indicated they attempt to use as small a gate as possible, for they have found this practice to give them the cleanest castings. Their normal practice is to gate into the light end of the casting and feed the heavy end. They attempt to keep their sand at approximately room temperature, using as little permeability as possible. The necessity of using only clean sand was stressed.

In the discussion, which was under the technical chairmanship of Chapter Chairman Dr. N. E. Woldman, Eclipse Aviation Div., Bendix Aviation Corp., Bendix, N. J., Mr. O'Connor

*International Nickel Co., and Secretary, Metropolitan chapter.

Good fellowship was quite evident at the Wisconsin chapter Christmas party as foundrymen gathered for a good time.
(All photos of the Wisconsin chapter Christmas party submitted through the courtesy of John Bing, A. P. Green Fire Brick Co.)

stated his preference for the use of controlled pouring temperatures rather than risers to obtain sound castings. He did not look with favor upon peening castings to close small leaks, pointing out that it was not good practice, and was unacceptable from the standpoint of U. S. Navy specifications. Likewise, the practice of impregnating castings with water glass or shellac was not recommended. With reference to a question concerning the proper temperature for molding sand, Mr. O'Connor pointed out that he has found sand as cold as 40°F. to give trouble with gassy castings — trouble which was eliminated increasing the sand temperature 70°F.

He indicated that 90°F. might be considered the maximum sand temperature for a day when room temperature was 75°F. The high quality of Mr. O'Connor's talk was apparent from the tone and length of the discussion following it. The group was very much interested in examining a number of castings which Mr. O'Connor displayed, demonstrating various types of defects.

Northern California Effected by Blackouts

By Geo. L. Kennard,*
San Francisco, Calif.

NORTHERN CALIFORNIA held its first meeting of 1942 on schedule, January 9, at the Alexander Hamilton Hotel in San Francisco with an attendance of 47. The turnout was good when we consider recent blackout experiences, and the possibilities of being marooned miles from home for an unknown period. Those 47 men registered an abundant supply of intestinal fortitude.

Chapter Chairman E. M. Welch, American Manganese Steel Div., Oakland, turned the meeting over to Program Chairman J. L. Francis, Vulcan Foundry Co., Oakland, who introduced the speaker, R. E. Brown, Electro Metallurgical Sales Corporation.

Mr. Brown's explanation of what to do in the trying times of urgent demand for increased production of first class castings from some poor and generally scarce material was attentively listened to. His talk on "Ladle Additions to Gray Iron Castings" opened up many questions, all of which he answered with satisfaction.

*Northern California Foundrymen's Institute, and Secretary-Treasurer, Northern California chapter.

A few of the personalities present at the Wisconsin chapter Christmas party.

Toledo Chapter Hears Dunbeck at First Meeting

THE first meeting of the Toledo District Chapter since it was organized last December was held Friday, January 9, at the Hillcrest Hotel. With Chapter Chairman Victor Zang, Steel Casting Div., Unitcast Corp., presiding, some sixty members and guests were present for the dinner.

Chairman Zang, in opening the meeting, introduced guests from other chapter territories and the new members. He then presented R. E. Kennedy, National A.F.A. Secretary, who told of the plans being made for the First Western Hemisphere Foundry Congress and exhibits of foundry equipment and supplies and exhibits of ordnance material produced by foundries, all of which will be held in connection with the 46th Annual Convention of the A.F.A., Cleveland, Ohio, the week of April 20-24.

Chairman Zang presented, as the main speaker of the evening, Norman J. Dunbeck, Eastern Clay Products Company, Eifort, Ohio, who talked on synthetically bonded molding sands. Mr. Dunbeck, in his discussion, used a rather novel procedure by showing how the properties of any sand can be changed through showing the effects of varying

The Birmingham Chapter educational courses hold interest for both old and young alike. Here Herbert Farr, Sanitary Pipe Co., Alexander City, Ala., lectures to them on pattern design.

Chapter Chairman V. E. Zang, Steel Casting Div., Unitcast Corp., Toledo, holding the cast iron baby rattle presented to the Toledo Chapter "to have and to hold" until the next chapter is formed.
(Photo courtesy S. N. Farmer, Sand Products Corp., Cleveland, Ohio)

moisture, bonding material, ramming, etc. This method of presentation was used to show the foundryman what he should do if troubles of any type were encountered in his sand control. An extensive discussion of the points of Mr. Dunbeck's talk followed.

Chairman Zang, in closing, announced that the next meeting of the chapter would be held Friday evening, February 13.

N.I.-S.W. Joins in Meeting With Other Societies

THE Northern Illinois-Southern Wisconsin chapter of the American Foundrymen's Association co-operated with American Institute of Electrical Engineers, American Society of Mechanical Engineers, National Association of Powers Engineers, Rockford Engineering Society, American Society of Mechanical Engineers, American Society of Tool Engineers, Society of Production Engineers and the American Society of Metals in a meeting on December 18 at the Faust Hotel, Rockford, Ill. The meeting was sponsored by the Rock River Valley Engineering Council, of which the above engineering societies and associations constitute the membership. The meeting was addressed by H. D. Sanborn, General Electric Research Laboratory, Schenectady, N. Y. Mr. Sanborn demonstrated how light can be heard.

Group Discussions at Michiana Bring Crowd

THE January 13 meeting of the Michiana chapter brought a splendid turnout, several more than the entire chapter membership. Held at the LaSalle Hotel, South Bend, some 95 were present for the dinner. In the absence of Chapter Chairman Ed Bumke, Oliver Farm Equipment Co., South Bend, Ind., Vice Chairman H. Klouman, Michiana Products Corp., Michigan City, Ind., presided and presented C. E. Westover, executive vice president of the A.F.A. from the Chicago office. Mr. Westover gave a short talk, explaining the activities of the national Association and plans for the forthcoming annual convention which will be known as the First Western Hemisphere Foundry Congress. He also explained the place of the Foundry and Allied Industries Exhibition in furthering war production efforts on the part of the foundry industry.

V. C. Bruce, Buckeye Products Co., Elkhart, Ind., chairman, membership committee, was called upon and he introduced the several new members who were present.

The members were then divided into two groups, the non-ferrous hearing Wm. Romanoff, H. Kramer & Co., Chicago, discuss non-ferrous foundry practice, the second group hearing Tom Barlow, Vanadium Corp. of America, discuss alloy iron casting theories and practices.

Pictures taken at the January meeting of the Michiana chapter at South Bend, Ind. Top—At the speaker's table sit (left to right) L. L. Andrus, chaper secretary-treasurer, American Foundry Equipment Co., Mishawaka, Ind.; William Romanoff, speaker, H. Kramer & Co., Chicago, Ill.; Vice Chairman H. Klouman, Michiana Products Corp., Michigan City, Ind.; Tom Barlow, speaker, Vanadium Corp. of America, Detroit, Mich.; and Executive Vice President C. E. Westover, American Foundrymen's Association, Chicago, Ill. Bottom—A group of fellows from the Dodge Mfg. Corp., Mishawaka, Ind., (left to right) G. Faller, Geo. Biltz, C. W. Peterson, M. Goodall and Chas. Brown.
(Photos courtesy L. N. Tucker, City Pattern Works, South Bend, Ind.)

A few of the Wisconsin chapter officers present at the Christmas party. Top—(left to right) Director Harry Ladwig, Vice President H. C. Waldron and President A. C. Ziebell. Bottom—(left to right) Secretary George K. Dreber, Director T. E. Ward and Director Fred Pritzlaff.

Apprentice Patterns at Central New York

By N. Harold Boardman,* Elmira, New York

PATTERNMAKING was emphasized at the Central New York chapter meeting held January 9 at the Onondaga Hotel, Syracuse. Chapter Chairman L. D. Wright, U. S. Radiator Corp., Geneva, presided over the meeting.

Speaker for the meeting was G. A. Pealer, Elmira Foundry Co., Inc., Elmira. Mr. Pealer had on hand at his lecture the patterns made by apprentices for the 1941 Apprentice Contest held in New York City during the Annual Convention. These patterns were on display and the speaker made many interesting comments about them during his talk. Mr. Pealer also had the article prepared by Frank C. Cech, Cleveland Trade School, Cleveland, O., that appeared in the January issue of *American Foundryman,* distributed to those attending so that an open discussion could be carried on concerning these patterns. The discussion brought out much valuable information and gave all a chance to see the high type of work that apprentices do.

*Mgr., Elmira Foundry Co., Inc., and Vice Chairman, Central New York chapter.

Human Relations Talk by Nelson at Chicago

BEFORE a group of 125 local foundrymen Thomas Nelson, Dale Carnegie Course Corp., New York City, gave a very inspiring and informative talk on "Human Relations." The meeting was presided over by Chapter Chairman L. L. Henkel, Interlake Iron Corp. Vice Chairman A. G. Gierach, American Manganese Steel Div., and Program Chairman, introduced the speaker to the audience.

Mr. Nelson through his long experience in the field of human relations, presented one of the best talks heard by the chapter. His discussion centered somewhat around Mr. Carnegie's book "How to Win Friends and Influence People" and the speaker elaborated upon a few of the author's suggestions. He emphasized the importance of more mental cooperation between men in solving problems of economical and political importance.

A movie also was presented through the courtesy of the Illinois Clay Products Co., Chicago, Ill.

Western New York Core Talks Attract Crowds

By Eliot Armstrong.* Buffalo, N. Y.

THE December 5 meeting of the Western New York chapter drew the largest attendance in our history, there being over a hundred for dinner and added guests for the business session that followed. Thomas J. O'Rourke, Manager, Contract Distribution Division, O.P.M., gave a very interesting and instructive talk on how foundries can render the maximum of cooperation in our defense effort and at the same time benefit themselves by fuller participation in defense activity.

C. A. Barnett, Foundry Equipment Co., Cleveland, made the

*Inter-Allied Foundries of New York State, and Secretary, Western New York Chapter.

Two groups of Wisconsin foundrymen enjoying themselves at the Wisconsin chapter Christmas party.

foundry talk of the evening, his subject being core baking and mold drying, with which he has had over 25 years' specialized experience. Mr. Barnett's talk, coming on top of the November meeting's study of core making and molding machines, was most timely and the question and answer period extended for well over an hour.

Party and Non-Ferrous Talk at N.I.-S.W. Chapter

By J. R. Cochrane,* Rockford, Ill.

DECEMBER 5 over 300 foundrymen gathered at the Hotel Faust, Rockford, for the annual Christmas party of the Northern Illinois-Southern Wisconsin chapter. A highly enjoyable evening was had by all who attended the party and with the good meal served along with the gay floor show it was agreed upon that this was a very successful party.

Walter Edens, Ampco Metal, Inc., Milwaukee, Wis., was the guest speaker at the January 13 meeting of the chapter held at the Hotel LaFayette, Rockford, Ill. George K. Minert, Gunite Foundries Corp., had charge of the meeting.

The subject of Mr. Eden's talk was "Non-Ferrous Foundry Practice." The speaker gave an excellent presentation of his subject and was interrupted frequently by an interested audience with many questions.

Following his talk a colored movie of plant operation at Ampco Metal was shown and that drew a lot of attentive questions also.

*Metallurgist, Sundstrand Machine Tool Co., Foundry Div., and Technical Secretary, Northern Illinois-Southern Wisconsin chapter.

Shaner Reviews War Effort at Cleveland

By Edwin Bremer,* Cleveland, O.

IN spite of below zero temperature over 100 were present at the regular meeting of the Northeastern Ohio chapter held at the Cleveland Club on January 8. President Frank J. Dost, Sterling Foundry Co., Wellington, Ohio, presided, and he stated that all committees for the forthcoming annual convention and exhibition of the American Foundrymen's Association had been appointed. He also requested that all members work actively with their committees to insure an outstanding success.

Main speaker of the evening was Earl L. Shaner, president, Penton Publishing Co., and editor-in-chief of *Steel*, who discussed "The Foundry Industry in War Time." He reviewed America's preparation for war from 1933 to Dec. 7, 1941, when Pearl Harbor was attacked. He pointed out that the United States in company with other democratic nations watched Hitler's preparations with a complacency that is embarrassing in retrospect. While Hitler was mobilizing every resource for conquest, the government of the United States not only was discouraging private enterprise, condemning the machines as an economic and social menace, and fanning the flames of a dangerous class feud, but it also was sending valuable equipment, materials and supplies to our potential enemies.

*Metallurgical Editor, *The Foundry*, and Chairman, Publicity Committee, Northeastern Ohio chapter.

Thiel Presents Sand Data at Twin City

By O. W. Potter,*
Minneapolis, Minn.

THE January meeting of the Twin City chapter was held Monday, January 19, in the Coffman Memorial Union at the University of Minnesota, Minneapolis, Minnesota.

Approximately 100 members and guests gathered for this meeting. A new scheme was tried to promote acquaintanceship by having each member wear a badge showing his name and company.

Immediately following the dinner a short business meeting was held before taking up the regular program for the evening. The first part of the program was the sound movie, "Goose Lake Fire Clay Deposits," which was presented by A. S. Nichols, Sales Manager, Illinois Clay Products Co., Chicago, Ill. This picture presented in a very interesting fashion a history of the deposits and mining, and their preparation into the various commercial fire clay products for use in industry. The second part of the program was given over to Dr. George A. Thiel of the Geology Department of the University of Minnesota, who talked on the "Geological History of Molding Sands."

*University of Minnesota, and Secretary-Treasurer, Twin City chapter.

Officers Elected at New England Meeting

By Merton Hosmer,* Boston, Mass.

THE annual meeting of the New England Foundrymen's Association was held January 14 at the Hotel Gardener, Boston, Mass. The election of officers for the year was held. The following officers were elected: *President*, Raymond Meader, Whitin Mfg. Co., Whitinville, Mass.; *Vice President*, Augustus W. Calder, New England Butt Co., Providence, R. I.; *Treasurer*, Arthur Gibby, East Boston, Mass; and *Secretary*, Ernest F. Stockwell, Barbour - Stockwell Co., Cambridge, Mass.

*Chemist, Hunt-Spiller Mfg. Co., and Reporter, New England Foundrymen's Association.

Quad City Reports on Party and Meeting

By J. Morgan Johnson,* Moline, Ill.

THE January meeting of the Quad City chapter was held at the Fort Armstrong Hotel, Rock Island, Ill., January 9. There were 75 present for the dinner and 100 for the lecture presented by C. E. Westover, executive vice president, American Foundrymen's Association, Chicago, Ill., on "Steel Castings." Also at this meeting were Vice President D. P. Forbes, Gunite Foundries Corp., Rockford, Ill., and National Director M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.

The annual Christmas party was held at the Elks Club, Moline, Ill., on December 12. There were 275 present for the dinner and entertainment which featured the chapter's party.

*Tri-City Manufacturers Assn., and Secretary-Treasurer, Quad City chapter.

Abstracts

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.
When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Casting

CHILLS. *"The Use of Chills or Denseners on Castings of Unequal Section,"* by F. E. Fisher, *Pig Iron Rough Notes,* No. 86, Autumn, 1941, pp. 20-24. This article states that chills are used either inside or outside of the mold in order to shorten the period of cooling to prevent the formation of cavities in sections which are inclined to become defective. Denseners are used to refine and close the grain of casting surfaces which are subjected to wear. Illustrations in the paper show the effect of chill on three irons of widely different silicon and also illustrates the effect of denseners on three gray irons of similar analysis. Any carbon steel or cast iron can be used in making denseners. Thin or flat denseners can be used many times and give best results if emery ground each time after being used. If used in green sand molds they are dipped with oil followed by the liberal use of plumbago. If used in cores or molds which are to be dried, they are treated with core oil and dried before being placed in the sand. (Ca.)

REPLACEMENT. *"Castings Replace Forged Steel Parts,"* Carl F. Joseph, *The Foundry,* vol. 69, No. 12, December, 1941, pp. 54-56, 137-139. Material discussed in this article is known as ArmaSteel, which is referred to as a graphitic steel, because the matrix closely resembles that of a spheroidized steel. This product is made from white cast iron and of the following composition: 2.65 per cent carbon, 1.30 per cent silicon, 0.40 per cent manganese, 0.13 per cent sulphur, and 0.05 per cent phosphorus. In heat treating, the castings are brought to the proper temperature to remove all the massive carbide, then oil or air quenched from 1600°F. This is followed by a draw treatment to improve machinability and control physical properties. Graphitic steel has many desirable properties which makes it outstanding in the ferrous field. The machinability is better than steel forgings, it has excellent damping characteristics, has a high yield ratio, possesses high fatigue life, responds readily to localized hardening and a high hardenability rating. A considerable saving in tool life is effected in the machining of the castings due to less metal removed and an easier machinable metal. The author lists eight advantages of graphitic steel castings in closing his paper. (Ca.)

Cast Iron

ALLOYS. *"Supply of Alloys for Cast Iron,"* by Harold S. Austin, *Metal Progress,* vol. 40, No. 6, December, 1941, pp. 886-887. In respect to the supply of ferro-alloys, with the exception of nickel, the foundries are receiving sufficient alloys to take care of their present needs. For civilian use, nickel is out of the picture. In discussing nickel the author says that nickel in the iron tapped has been steadily decreasing and is noticeable in the machine shop. Materials left to fill the gap are pig iron, scrap steel, scrap bundle iron and steel borings. Other materials discussed by the author includes copper, molybdenum and the use of silicon. Many interesting sidelights are presented. (C.I.)

Core Mixtures

HOT STRENGTH. *"Core Mixtures Controlled by Hot Strength Test,"* by F. B. Riggan, *The Foundry,* vol. 69, No. 11, November, 1941, pp. 60-61, 152-153. A very satisfactory oil sand core procedure for steel castings had been in operation at the author's plant until production was stepped up out of proportion to the core baking facilities. It was found that larger cores, although hard to the center, were not properly baked all the way through. A wood pattern the same shape but slightly larger than a tensile test core, was used to form an impression at the center of cores four inches in diameter or larger. The test core was placed carefully into the impression and the half core with the test core in place was then turned out of the core box onto the core drying plate. The tensile cores would have satisfactory hardness and strength if they were removed from the large core while hot and cooled in air, but if allowed to remain in the large core and cool while protected from the air, they would not show satisfactory hardness and strength. This indicated that the large oil core was not baking to the center. The author explains why the use of crude sand was discontinued and why cores baked in an elevator type continuous oven at 515°F. with an overall cycle of 2½ hr. was not satisfactory. The company then standardized their three core mixtures for their entire range of work. The paper describes the core mixtures used for small diameter cores, core mixture for cores having heavy wall thickness and core mixture for large diameter cores. Iron oxide was added to the core mixture for cores having heavy wall thickness to prevent burning in on the inside of the casting where sharp corners or abrupt changes in section occurred. The idea of controlling core mixtures entirely by hot strength test seems to prove out in practice and the unexpected discovery that these hot strengths could be obtained solely by the addition of iron oxide is of great interest. (Sa.)

Cupola Operation

BRIDGING. *"Bridging—A Costly Nuisance,"* by M. L. Carl, *Pig Iron Rough Notes,* No. 86, Autumn, 1941, pp. 11-15. The author in this article points out various ways in which bridging is caused and include having too much air blown in excess of the weight of air needed, having the tuyeres too near the bottom of the cupola, causing the lining to burn badly, and small cupolas are more susceptible to bridging than larger cupolas. In solving this problem the author suggests that on a long heat it might be advisable to shut the blast off and punch the bridge out of the tuyeres. It is possible to punch the bridge loose with the blast on, although it is a mean job and the melting rate is reduced due to the loss of blast. Various other methods of removing bridges are outlined by the author. (F.)

MELTING. *"Melting Quality Castings in the Cupola,"* by Harold S. Austin, *The Foundry,* vol. 69, No. 12, December, 1941, pp. 58-59, 140-144. In continuing his discussion from this continued article the author concludes his presentation of the closeness of the fracture of iron by commenting upon the six potent factors that control the finess of fracture. Fluidity is important in the production of good castings and the author turns his attention toward the discussing of this factor. Temperature and composition tend to have quite a bearing on fluidity. Experience has shown that the percentage of silicon and carbon are the two elements in the composition which exert the most influence, and especially carbon. The author then presents data to prove his point. The author comments on the two types of hot blast cupolas; one type the internal heat source, the air blast is heated by the exhaust gases. The other type is heated by an external heat source, usually a small powdered coal plant, in which the powdered coal combustion gases pass through checker work or around ducts through which the cupola air blast travels. Also discussed is duplexing. In concluding his article the author presents material on coke and cupola refractories. (F.)

Historical

IRON AND STEEL. *"The Forge of Vulcan,"* by John W. Higgins, *Mechanical Engineering,* vol. 63, No. 7, July, 1941, pp. 527-534. This is a historical review of the iron industry and the contribution of armorers to the metal-working art. Iron ores are widely distributed over the world but the Hittites on the Black Sea in 1400 B.C. are supposed to be the first ironworkers to control the carbon content of steel. From that date on iron was used in the making of weapons and armor until the 17th century when blast furnaces and rolling mills began producing "steel" for many uses. The author points out some interesting facts about early examples of

casting iron which makes quite a contrast between their method then and that which is employed today. (C.I.)

Hygiene

ILLNESS. *"War Declared on General Illness,"* by Harvey M. Hall, *Steel,* vol. 109, No. 26, December 29, 1941, pp. 48-49, 75. Colds contribute about 50 per cent toward the 190,000,000 work hours lost to industrial production yearly. An attempt has been made by the author to show that the average health program costs $8 per employe per year, but it will yield a return of $12 per workman per year. The program set forth in this article is divided under four general headings: Examinations, nutrition, environment and health education. Each of the various divisions is discussed in detail and explained to us as to its relation in keeping an employe physically and mentally fit for his job. (Hy.)

Manganese

CONSERVATION. *"Emergency Conservation of Manganese," Metal Progress,* vol. 40, No. 6, December, 1941, pp. 888-893. The American iron and steel industry requires annually about 1,300,000 tons of high grade manganese ore to produce its goal of 90 million tons of ingots. A survey has shown that, provided the consumer will cooperate, the use of ferromanganese could be lessened by about 20 per cent. The conservation of manganese in steel making can be done by using these four recommendations: Regulation of manganese content of pig iron; lowering the slag volume of the open-hearth furnace; increasing the efficiency of ferromanganese additions and substitutions of other metals. The author also presents some specific recommendations for soft steel and structural steels and along with this lists various other elements that should be given consideration when such elements as nickel, vanadium and manganese cannot be used for strengthening effect. (Al.)

Materials Handling

FOUNDRY. *"Planned Materials Handling Improves Foundry Operation,"* by S. F. Swain, *Steel,* vol. 109, No. 24, December 15, 1941, pp. 80, 85. Purchase of equipment by the foundry in this article has been made with more and more emphasis on closer control of physical and chemical analyses and improvement of quality of the iron. These were the main reasons for erecting a new charging floor served by elevators, instead of charging the cupola from the ground. Raising the charging level helps improve quality. Descriptions are given of various pieces of equipment added and the advantage of having them installed. (M.H.)

SORTING CASTINGS. *"Sorting Castings," Steel,* vol. 109, No. 19, Nov. 10, 1941, pp. 80-81. A procedure worked out by the Pontiac Motor Co. cuts out a varied batch of parts being cleaned simultaneously and the subsequent sorting of the cleaned work which adds substantially to the cost of the cleaning department. The method used is novel and gives this company a greater efficiency without much expense and outlay of capital. (M.H.)

Metallography

GRAPHITE FLAKES. *"The Polishing of Cast-Iron Micro-Specimens and the Metallography of Graphite Flakes,"* by H. Morrogh, *Foundry Trade Journal,* vol. 64, No. 1292, May 22, 1941, pp. 343-345, 348. The author concludes his paper by showing that the graphite flakes in gray cast iron can be retained quite easily during the polishing operation with but few changes in normal recommended procedures. The ideal to aim for is a smoothly polished metallic matrix free from surface distortions and smoothly polished graphite flakes with no burnishing or flowing of the metallic matrix over the graphite flakes. The process which has been described here enables the complete preservation of the graphite flakes and the polishing operation, if correctly adhered to, produces specimens perfectly prepared for photomicrography. The polishing procedure given by the author has the advantage that it is a comparatively rapid method of specimen preparation and the stages are quite simple. It is rather difficult to give any accurate times for the preparation of specimens, but as a rough guide it can be said that it should be possible to prepare a specimen of a cross-section from a 0.875-in. dia. test bar in 15 min., that is, including cutting, grinding, rubbing down, polishing and etching. The actual time required for specimen preparation by this method is to some extent a function of the number of times the specimen is etched and repolished, and this again depends on the structure of the specimen and on the perfection required. For the routine visual examination of cast irons, it is frequently unnecessary to have the graphite flakes perfectly prepared. In these cases only a rough idea of the general structure is needed and the number of polishing and etching operations can be reduced to a minimum. However, no specimen should have less than three polishings and etchings, and in only a very few cases should it be necessary to polish and etch more than ten times to obtain a perfectly prepared specimen. The repeated etching and polishing operation not only improves the appearance of the graphite structure, but also gives a better finish to the metallic matrix and the author advises the adoption of this type of technique in the preparation of specimens taken from nearly every type of ferrous and non-ferrous alloy. (Te.)

Non-Ferrous

PLANT PLANNING. *"Planning the Non-Ferrous Foundry,"* by N. K. B. Patch, *The Foundry,* vol. 69, No. 12, December, 1941, pp. 64, 152-154. In planning the erection of a non-ferrous foundry numerous factors arise. The first is the shape and size of the available plot of ground, and next is the type of work contemplated and the amount demanded. There will be a difference if you plan to make small light castings or heavy machinery castings. The foundry should be fireproof with ample and abundant natural light. As for the roof, the author recommends a peaked roof with a monitor on the top of it for ventilation purposes. A roof that contains a series of pockets with adequate outlets into which each upward current of air is led directly to the ventilating exit offers the best manner in which to eliminate the atmosphere that should be ejected from the foundry. In closing the author comments upon the furnace positions, location near a railroad siding, space for metal and sand storage and the provision for pipe passageways. (N.F.)

TOP-POURING. *"Non-Ferrous Applications of Top-Pouring Methods,"* by A. K. Higgins, *Nassu,* vol. 3, No. 2, December, 1941, pp. 5-13. This paper is devoted to the application of top-pouring to non-ferrous castings such as bushings, pump impellers and pump casings. The author finds the method more applicable to the non-ferrous alloys typified by such alloys as 80-10-10, 85-5-5-5, 75-10-15 than to such alloys as aluminum or manganese bronze. He points out that by using top-pouring on the former alloys mentioned that he is enabled to pour at lower temperatures, which enhances the physical properties of the alloys, produces sounder castings, and reduces the amount of metal needed for gates and risers. (N.F.)

Refractories

ABRASIVES. *"Abrasives in the Role of Super-Refractories,"* by H. C. Fisher, *Metal Progress,* vol. 40, No. 2, August, 1941, pp. 177-182. The term "super-refractory," used in this paper signifies a superior refractory. The author presents a table which summarizes typical characteristics of bonded refractory electric furnace products. Under abrasives available for refractories the author discusses fused alumina and silicon carbide. Other synthetic refractory materials not classified as abrasives are electrically fused magnesia, mullite, spinels and forsterite. Each one of these is discussed individually. To complete the presentation the author mentions some refractory minerals occurring naturally and include corundum, bauxite, diaspore, sillimanite, andalusite, kyanite, kaolin, zirconium oxide and silicate, chromite and silica. In a selection of a refractory it is no simple problem to obtain a refractory to meet a set of given conditions. A table has been made by the author that estimates the relative factors for determining the usefulness of commercially available products, and is presented as a basis for making an initial approach by the user to the selection of a refractory for a new purpose or to avoid existing difficulties with another material. It is only an approximate classification. (Re.)

Safety

ACCIDENTS. *"How to Reduce Accidents and Influence Workers,"* by S. C. Hickok, *Occupational Hazards,* vol. 3, No. 10, July, 1941, pp. 6-9, 26. The author relates how the Pacific Mills sold safety rules and regulations to their workers through modern means. They distributed matches with safety rules on the covers, they asked for essays on safety, they obtained numerous drawings from employees that were in turn made into safety calendars, they sponsored safety contests, they handed out safety booklets and posted interesting safety pictures. The result was a safety record for the company that should be the envy of all safety committees and safety engineers. (Se.)

Steel

DEFENSE. *"Steel Castings in Defense,"* by C. L. Harrel, *Steel,* vol. 109, No. 23, Dec. 8, 1941, p. 104. Upward of 75 per cent of the present output of the steel casting industry is going directly or indirectly into the defense program. Steel castings are going into tanks, ships, guns (both light and heavy), and even aircraft. This has been due to the castings process lending itself to mass production and relatively short-term deliveries. The reason steel castings are so widely used in defense work, says the author, is due to the

fact that cast steel can be made with almost any desired set of mechanical properties. (S.)

MANGANESE-MOLYBDENUM. *"New Data for Evaluating Manganese-Molybdenum Steels,"* by Robert M. Parke, James R. Blanchard and Alvin J. Herzig, *Metal Progress,* vol. 40, No. 6, December, 1941, pp. 906-910. Since chromium and nickel, especially the latter, are critical metals to be reserved for such purposes as they alone can serve by reason of their unique properties, it is important to find an alternate alloying element to provide their hardening power in steels. By doubling the manganese and molybdenum and leaving out the chromium and nickel, steels comparable in hardenability to the S.A.E. 4100 and 4300 series are produced. (S.)

PHOSPHORUS. *"Phosphorus Concentrates on Steel Blow-Hole Surfaces," The Iron Age,* vol. 148, No. 26, December 25, 1941, p. 51. That phosphorus concentrates on the surfaces of the tiny air pockets or blow-holes on the surfaces of cast iron or steel has been proved by Dr. M. Shoupp, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The fact that excess phosphorus tends to embrittle steel makes this discovery important since it may lead to improvements in steel-making technique. How Dr. Shoupp used radioactive tracers to prove his theory is described in this article. (S.)

Test

HARDENABILITY. *"Standardization of Hardenability Tests,"* by Walter E. Jominy, *Metal Progress,* vol. 40, No. 6, December, 1941, pp. 911-914. This article gives the Chrysler Corporation's agreed-upon routine for making hardenability tests, both by the method of quenching a 3-in. bar and measuring its cross-wise hardness, and by the method of end quenching a 1-in. bar and measuring its length-wise hardness. The latter process is preferred by the Chrysler Corporation. (Te.)

NON-DESTRUCTIVE. *"Non-Destructive Testing of Light Metal Castings," The Metal Industry* (London), vol. 49, No. 19, Nov. 7, 1941, p. 296. Non-destructive tests must be supplemented by destructive tests, but the number of these is limited. The authors deal with surface defects, such as cold-shuts, oxide films and others, and add that such defects are only superficial and can be removed. Direct X-ray inspection can be used to detect large gas inclusions, blowholes, and large oxide inclusions. Radiographic inspection, in which a photograph of the casting is obtained, will show up micro-porosity. Another method used to detect micro-porosity was developed experimentally and is outlined in detail. A discussion also is presented concerning work done on the development of an etching test which would enable the detection of micro-porosity in Elektron castings in all cases when such defects reach the surface of the castings. (Te.)

Training

EMPLOYE. *"Employe Training," Canadian Metals and Metallurgical Industries,* vol. 4, No. 12, December, 1941, pp. 328-331. This is an outline of the plan being used by the Otis-Fensom Elevator Co., Ltd. The system has been made such a big success only through the organization of every step, including selection of employes, training methods, analysis of individuals for the job to which they are best suited and other similar problems. The Employes' Training School at this plant operates in a fenced-off portion of the production floor. A list of the equipment it contains is presented. Trainees work on various parts through their course, which usually averages five to six weeks. The manual of procedure for the employes' training is largely concerned with setting down definite rules to be followed in connection with training. The present ratio of training in this plant is five girls to one man and this has turned out to many advantages as girls do a particularly fine job, due to their delicate touch, on operating machines to close tolerances. When the war broke out trained workers were not available from any other source and this successful employe training plan was the only answer to a very difficult problem. (Tr.)

February Chapter Meeting Schedule

February 2

Central Indiana
Washington Hotel, Indianapolis
E. D. MOONEY, Federated Metals Div.
"Non-Ferrous Gates and Risers"
C. T. GREENIDGE
Battelle Memorial Institute
"Control Tests for Gray Iron"

✦

Metropolitan
Essex House, Newark, N. J.
H. D. PHILLIPS, Lebanon Steel Foundry
"Recent Developments in the Steel Foundry"

✦

Western Michigan
Rowe Hotel, Grand Rapids
E. C. BARRINGER,
Institute of Scrap Iron and Steel

✦ ✦

February 6

Western New York
Hotel Touraine, Buffalo
L. B. KNIGHT, JR.,
National Engineering Co.
"Sand"

✦ ✦

February 9

Chicago
Top of the Town Restaurant
C. E. SIMS, Battelle Memorial Institute
"Porosity in Cast Metals"

✦ ✦

February 10

Cincinnati District
Cincinnati Union Terminal Restaurant
JAS. B. HARVEY,
Priorities Field Service, O.P.M.
"Operation of O.P.M. Office"

✦

No. Illinois-So. Wisconsin
Hotel Lafayette, Rockford, Ill.

February 13

Northern California
Del Monte Hotel, Del Monte
H. S. SIMPSON,
National Engineering Co., and
President, A.F.A.
"Castings in Industry"
J. A. GITZEN, Delta Oil Products Co.

✦

Philadelphia
Engineers Club
PROF. G. E. DOAN, Lehigh University
"Radiographic Inspection"

✦

Toledo
Hotel Hillcrest
ELMER C. CARMODY, C. C. Kawin Co.
"Study of Causes and Remedies of Defects in Castings"

✦ ✦

February 16

Quad City
Blackhawk Hotel, Davenport, Iowa
JOHN LOWE,
Battelle Memorial Institute
"Cupola Melting Operations"

✦ ✦

February 17

Southern California
Scully's Restaurant, Los Angeles
H. S. SIMPSON,
National Engineering Co. and
President, A.F.A.
"Castings in Industry"

✦ ✦

February 19

Detroit
Huyler's Men's Grill
H. B. SWAN, W. B. MCFERRIN,
C. H. HUNGERMAN, L. W. THAYER,
Cadillac Motor Car Co.
"Operations in Cadillac Foundry"

February 27

Ontario
Royal Connaught Hotel, Hamilton
L. P. ROBINSON, Werner G. Smith Co.
"Variables Which Affect the Baking of Cores"

✦ ✦

Joint Meetings

February 11

Michiana Chapter, A.F.A. and Notre Dame Chapter, A.S.M.
Engineering Auditorium of University of Notre Dame
B. H. BOOTH, Jackson Iron & Steel Co.
"Silvery Pig Iron"

✦ ✦

February 13

St. Louis District Chapter, A.F.A., and Steel Founders' Society of America

✦ ✦

February 16

Northern California Chapter, A.F.A., and San Francisco Chapter, A.S.M.
Motion Picture Film—
"Amazing Legacy of Rudolf Diesel"—
Standard Oil Co.
S. P. KOVALEFF,
Enterprise Engine & Foundry Co.
"Production of Diesel Engines"

✦ ✦

Regional Conferences

Birmingham District Annual Regional Foundry Conference
February 19, 20 and 21
Tutwiler Hotel, Birmingham

✦ ✦

February 26 and 27
Wisconsin Chapter Regional Foundry Conference
Schroeder Hotel, Milwaukee

EVER SEE A CONVENTION IN A BOOK?

THAT is exactly what A.F.A. has done to this year's Bound Volume 49 (1941) Transactions. The proceedings of the 45th Annual Convention, held in New York City have literally been transplanted in over 1,100 pages of one of the most complete issues of Transactions ever published by the Association.

From the frontispiece of Past President Shannon to the author's index this book is crammed to capacity with valuable and practical data. Over forty papers are presented along with their complete discussions and cover such subjects as:

Gray Iron Founding
Steel Founding
Malleable Founding
Non-Ferrous Founding
Sand Research
Metallurgy of Metals
Core Practices
Melting Operations
Sand Reclamation
Refractories
Plant Equipment
Safety and Hygiene
Foreman Training
Apprentice Training
Foundry Costs
Pattern Making

and numerous other related foundry topics and committee reports.

DO NOT DELAY

Copies of the Bound Volume 49 (1941) Transactions will be sent to company members upon request gratis. Other members can obtain this book for $3.00. Non-member's price is $15.00.

A few issues of Bound Volumes 48 (1940), 47 (1939) and 46 (1938) are on hand but the supply is dwindling. The same prices prevail for these publications as for Volume 49. Start building your library from Volume 46. Fill in the blank below and mail in today with your check or money order.

(CUT OFF ALONG THIS LINE)

AMERICAN FOUNDRYMEN'S ASSOCIATION,
222 W. ADAMS STREET, CHICAGO, ILLINOIS

Date.....

Gentlemen:

Please find enclosed check (or money order)* for $ .....covering the Transactions number or numbers I have checked off below.

	Volume	Year	Member's Price	Non-Member's Price		Volume	Year	Member's Price	Non-Member's Price
☐	49	1941	$3.00	$15.00	☐	47	1939	$3.00	$15.00
☐	48	1940	3.00	15.00	☐	46	1938	3.00	15.00

Name.....Position.....

Firm.....

Address.....

*When Check or Money Order Accompanies Order, Books Are Mailed Postpaid.